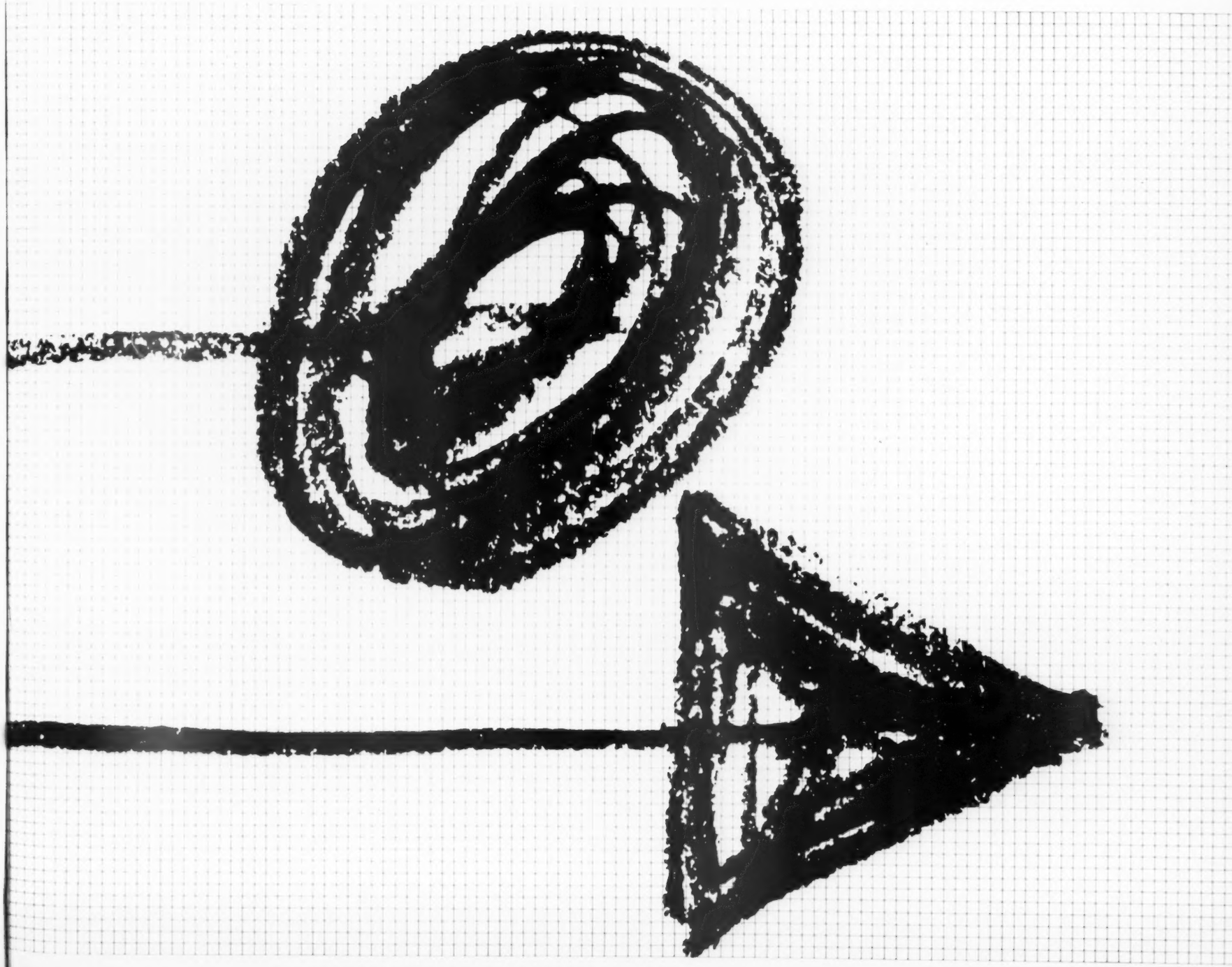
ARCHITECTURAL & ENGINEERING

NEWS

December 1959 Volume 1 Number 12



ARCHITECTURAL & ENGINEERING NEWS

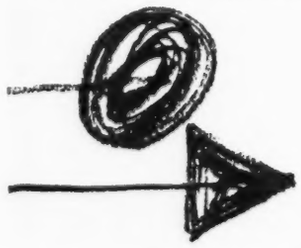
SUBSCRIPTION POLICY

Architectural & Engineering News is published monthly by Hagan Publishing Corporation, 452 Fifth Avenue, New York 18, N. Y. Circulated without charge to Architects registered in the United States and licensed Professional Engineers designated by those architects as their consultants in the structural, mechanical, and electrical aspects of architecturally designed construction. Subscription to others: per year $10.00 U.S.A. and Canada; $25.00 in foreign countries; $1.00 per single copy, U.S.A. and Canada; $2.50 per single copy in foreign countries.

Address all correspondence to: Architectural & Engineering News, 452 Fifth Avenue, New York 18, N.Y.

ARCHITECTURAL & ENGINEERING

N E W S



The arrow, the dot, and the grid are the working tools of modular coordination in contemporary building technology. This month's cover by Tony Palladino provides a graphic introduction to a feature news report on the current status of modular practice.

12

David B. Hagenbuch
co-publisher

Edward J. Fregan
co-publisher

John James Carlos, AIA
editor

Kay Susmann
associate editor

John W. Hannon
assistant editor

Anne L. Tingo
editorial assistant

Tony Palladino
graphic consultant

Robert S. Wilson
circulation and production manager

technical advisory panel
structural engineering:
Martin Lovett, PE

building technology:
Samuel S. Adlerstein, AIA

mechanical and electrical engineering:
Henry Wald, PE

field construction:
R. Cornell Hooks, RA

communications

Editor:
I just looked through your October issue and was happy to see on page 4 a description of the City National Bank building, designed by our office, to be erected in Los Angeles.
Unfortunately, there is some mixup in the captions of the pictures on this page. The top picture, which is credited to us is, I believe, the Indiana State Office building; the picture below it is the City National Bank building. Maybe you would like to run a correction on this.

Very sincerely yours,
Victor Gruen, AIA
New York, N. Y.

Editor's note: *Our apologies for a caption transposition on two projects shown in A/E NEWS, p. 4, October issue, top two right column photos. Top photo showing $15 million, 13-story Indiana State Office Building is by Architects: Graham-Anderson, Probst & White, Chicago, with Raymond S. Kastendieck, Gary, Ind., as Associate Architect. Photo directly below of $3 million City National Bank Building, Los Angeles, is by Victor Gruen and Associates.*

Editor:
Your company has been referred to us as having excellent literature (magazines) for building contractors. We specialize in residences and motels. We await any suggestion you may have regarding subscriptions.

Sincerely yours,
Ralph & Roy Maples
General Contractors
Gatlinburg, Tenn

Editor's note: *A/E NEWS is circulated without charge to Architects registered in the United States, and to licensed Professional Engineers designated by those architects as their consultants in the structural, mechanical and electrical aspects of architecturally designed construction. Subscription rates to all others: $10 per year; $1.00 per single copy.*

Editor:
I would like to know if it is possible for me to purchase one copy of your publication "Architectural & Engineering News" to send to some students of Architecture, and Engineering in Buenos Aires, Argentina. They have heard of your publication, and would like to know something about it, as they wish to subscribe if possible to it. . . .

Respectfully yours,
M. Soto
New York, N. Y.

Editor's note: *Thank you for your interest in A/E NEWS, a copy has been sent you. Much to our regret, we cannot offer a special student rate for subscriptions other than the established one. Future plans project the inclusion of student readers.*

gazette

Fred S. Dubin Associates, Consulting Engineers, announce admittance to partnership of Victor M. Garcia, PE, formerly Associate in Charge at San Juan office. Also Sam R. Fogleman, PE, appointed Associate in Charge of Mechanical Engineering and Jorge Rivera Valentin, PE, Associate in Charge of Civil, Sanitary and Structural Engineering.

Marvin G. Sturgeon, PE, named Vice President and Director of Engineering for Charles Luckman Associates, planning-architecture-engineering firm of Los Angeles and New York.

Vincent G. Kling, AIA, presented Honor Award in School Architecture by Pennsylvania Society of Architects. Award was bestowed for Riverview Park School near Laureldale, Pa.

P. L. Griffith, PE, elected Vice President of James King & Son, Inc. general contractors. Formerly of Kelly & Gruzen, Architects and Engineers.

Malcolm A. Burrows appointed Assistant to the Director of the National Housing Center in Washington, D. C.

Robert C. Cross appointed Executive Secretary of the *American Society of Heating Refrigerating and Air-Conditioning Engineers*, by the Board of Directors.

The *American Institute of Mining, Metallurgical, and Petroleum Engineers* announces availability of fourteen major awards for outstanding achievement, to be presented at its annual meeting.

Mrs. Martha Dwyer promoted to Assistant Professor of Architecture at Syracuse University.

Emanuel Turano, AIA, of Ives, Turano and Gardner, Architects of New York, was unanimously chosen to represent Cooper Union Art Alumni in Academic Procession and Convocation, on occasion of 100th Anniversary of The Cooper Union for the Advancement of Science and Art held November 2.

Office announcements

Ruppe & Giometti Engineers, Inc., to 3130 Maple Drive N. E., Room 106, Atlanta, Ga.

Puckett & French, Architect and Engineer, to 600 East Fourth St., Big Spring, Texas.

Geis-Hunter-Ramos, Architects, to 704 Davidson Building, 1627 Main St., Kansas City 8, Mo.

San Francisco office of Skidmore, Owings & Merrill to Crown Zellerbach Building, 1 Bush St.

Bernoudy-Mutrux, Architects, now Bernoudy, Mutrux & Bauer, Architects, 281 N. Lindbergh Blvd., St. Louis 41, Mo.

Victor M. Villemain, RA, consultant in site planning and landscape architecture, to 157 West 57 St., New York 19, N. Y.

DOCUMENTING BUILDING RESEARCH

One of the problems which the Building Research Institute is facing is that of documenting building research. An informational theory, excerpted here, was offered by Eugene Wall, Engineering Service Division, Engineering Department, E. I. du Pont de Nemours & Co., Inc., at the BRI Fall Conference.

". . . Onlookers at many conventions of us documentalists might well liken those meetings to conventions of witch doctors —whereat each witch doctor can *prove* that, in his own village, *his own* way of curing illnesses *is the only valid way*. If a *modern doctor* listened to the arguments of the witch doctors, he would probably be able to detect in each proponent's techniques some element of medical truth—albeit well mixed in with superstition. He would probably *also* note an underlying sameness in *valid* techniques among all the conference participants *and* would note that the differences among techniques generally were insignificant variables of superstition.

"Too many of us documentalists today are quite like the witch doctors in the example. We can't agree because we have no fundamental background in theory. In fact, some of us show no interest at all in fundamentals; we are more interested perhaps in the temporary success of our techniques in our own little area of interest—which we may assume to be typical. We lack understanding of environmental variables, just as the witch doctors lacked understanding of biological and psychological variables. A few of us assert that we have developed 'universally applicable' techniques which everyone should standardize upon.

"Today, however, I wish to at least *attempt* to don the headdress of an analytical, *research-minded* witch-doctor-documentalist, and—as such—to pose for you a question which already may well be uppermost in your minds. In this state of affairs, how can the *Building Research Institute*—relatively a novice in the documentation field—ever hope to winnow fact from superstition, and true general applicability from partisan pride? After all, there *are* some truths at hand in this field; there *are* some generally applicable fundamentals. But note, the word is 'fundamentals'—not 'techniques.' To draw an analogy to military operations, we might say that there is a fundamental strategy, but tactics should vary with the environment. Thus, in all well designed information retrieval systems, there are *fundamental elements of 'sameness,'* despite all the sound and fury which have enveloped them.

"Therefore, it would seem that the *Building Research Institute* would be well advised to gain an understanding of *strategic fundamentals*, and against this understanding you will find it possible to assess correctly the validity—and value—of alternate *tactical techniques*. In other words, I suggest that the *fundamental problems of information storage and retrieval be defined* so that you may compare the *capabilities* of proposed problem solutions in light of the basic characteristics of the problems. You see, in this business, as well as in all others, it seems that correctly defining the problem may well turn out to be more than half the task.

Problem definition

"Accordingly, let us today proceed first to *problem definition*. I believe that the definition to be set forth today is not a parochial nor provincial one; it is not particularly original with me nor with those with whom I have been working. Rather, we have gleaned bits and pieces of it from nearly all the workers in this field and have (we think) fitted it together like a jigsaw puzzle into a meaningful, generalized entirety. After problem definition we will proceed to a consideration of broad alternatives for solutions to the problems, and finally to some *possible* tactics which may be used to implement these generalized alternatives.

Communications

"It is apparent that the problem with which we are faced is a problem in communications. Specifically, it is a problem in improving communications among three sorts of individuals or groups: . . .

1. The *originator* of information—he who develops the information and he who writes it down.
2. The (let us call him) *indexer*—he who decides how the information is to be stored away so that it can later be retrieved.
3. The *searcher* for information—he who has a problem on which he needs help.

"If it be agreed that we are faced with a communication problem, we will have to decide, "what sort of a communication problem?" Communications problems may be of many kinds—e.g., acoustical, psychological, sociological, linguistic, mechanical, etc. Obviously, we cannot hope to solve *all* the problems of communication—nor need we. It does appear, however, that at least two basic facets of nearly all communicative problems are significant to the *Building Research Institute* during its consideration of information storage and retrieval.

Feedback of information

"The first of these considerations is what we may call 'feedback of information.' Actually, the existence of 'feedback' is a matter of degree; we have one dimension of a continuum. . . . For example, 'a conversation forms a two-way communication link; there is a measure of symmetry between the parties, and messages pass to and fro. There is a continual stimulus-response; remarks call up other remarks, and the behavior of the two individuals becomes concerted, cooperative, and directed toward some (communicative) goal.' [Cherry, Colin, *On Human Communication*, John Wylie & Sons, Inc., New York, 1957. pp. 16, 17.]

"Slightly farther along the continuum, the reading of a newspaper represents a unilateral, noncooperative communication (except when the reader writes letters to the editor or cancels his subscription). Still farther along the continuum, the author of a technical paper seldom has *immediate* opportunity to obtain 'feedback' from his peers in the technical field in which he is interested. Of course, near the end of the continuum, there is essentially no way for the recipient to form a 'cooperative link' with the originator of information. For example, an archeologist deciphering a stone inscription receives no help (except for nearby artifacts) from his forebears other than the signs carved upon the stone.

"In other words, the presence or absence of 'feedback' in the communication process, and the 'process time-constant' (or 'lag coefficient') of any 'feedback,' determine to a large extent how easy it is to achieve effective communication, which is: The transmission of meaningful knowledge from one source to one or more receivers. Accordingly, this 'feedback' dimension of the communicative continuum must, of necessity, concern us in our considerations.

Abstractness

"The other principal dimension of the communicative continuum with which we must be concerned is perhaps more familiar. It is concerned with the *degree of abstractness* of the information being communicated. What is meant by *abstractness?* Here we do not mean 'how far the information in question is abstracted from basic considerations,' in the sense that a table of logarithms is highly abstracted from a basic theory of numbers. Rather, when speaking of the 'degree of abstractness' dimension of the communicative continuum, *in this context it is best thought of as the degree of abstract thought required in employing the information involved.* Hence, a table of logarithms would be near the 'low' end of the abstractness dimension. By the same token, music has a very "high" degree of communicative abstractness, followed probably by art, humor and poetry in approximately that order.

"Now we have a two-dimensional communicative continuum under consideration; one dimension is 'degree of abstractness' and the other deals with 'feedback.' On the 'degree of abstractness' scale, we are not, insofar as storage and retrieval are concerned, interested practically in the extreme ends (in either such things as music or log tables). Near the middle of the spectrum, however, we can distinguish technical *ideas* (or *information*) and, near the 'low' end, *data*—and we might well be interested in the part of the spectrum bounded by these limits.

Retrieval zone

"Along the 'feedback' dimension we can distinguish such activities as conversation, message transmission, information (or data) processing, the reporting of results of calculations, retrieval, etc. . . . I will limit my consideration to the retrieval 'zone' and to those matters pertinent to retrieval.

"Further, because we are interested in research, we will limit our considerations principally to the information or 'idea' portion of the 'abstractness' spectrum, because this is the zone in which most research information falls. This is *not* to say that research does not develop data; rather, it is a recognition that the data

developed during research usually require *interpretation* by words—words which stand for *ideas* not easily quantifiable—and this returns us to consideration of the area of communications . . . this area does *not* include such things as *data processing* . . . quite a different matter.

"Accordingly, let us proceed to discuss problems arising in *information* (or *idea) retrieval*. Of course, in dealing with any situation, there are three sorts of problems which arise. . . . This is true in the realm of communications as it is in all other problem areas. First, we have the technical or intellectual problems which must be solved—and if these cannot be solved adequately, then there is no real point in worrying about the other sorts of problems which may face us. However, presuming that solution of the technical problems is possible, we must be concerned with economic problems. Our technical solutions must be economically attractive—or, at least, they must not carry with them an economic penalty. Finally, there are relationship or political problems.

"In line with our thesis that the technical problems must be solved in any event (and probably *must* be solved before the economic or political problems can be attacked effectively), let us first examine the specific technical problems with which we are faced in this area of communication—in information retrieval. There appear to be but four technical or intellectual problems significant to this area. . . . These are the problems of viewpoint, generics, semantics, and syntactics. The first two of these problems are characteristic of human thought, as will be illustrated shortly, and the last two are characteristic of the particular language involved—in our case, English.

Viewpoints

"Let's first consider the problem of *viewpoint*. Every individual is a unique composite of the combined, cumulative effects of his education, experience, background, environmental conditioning, and relationships with other individuals. Accordingly, individuals contemplate objects, ideas, facts or images with different viewpoints. 'How you look at it' depends on how you got where you are *when* you look at it. . . . It is not difficult to see that the word 'oil' may be variously interpreted to mean: petroleum, lubricant, road surfacing material, cooking material, vehicle for medicines, fuel, source of other fuels, perfume base, hair dressing, paint vehicle, polish, etc. Many words are similar to 'oil' in that it is perfectly reasonable to assign them to more than one *logical class*. During indexing, it is necessary to insure that variations in *viewpoint* among originators, indexers and users of information will not result in 'missing' vital information during retrieval.

(Continued on page 36)

ae news

AIA portfolio

FEDERAL BUILDINGS, 1960, an exhibition prepared by the Public Buildings Service of the General Services Administration will be open to the public from November 20 to January 7, 1960, in the Gallery of the Octagon, headquarters of *The American Institute of Architects,* 1741 New York Ave., Washington, D.C. The exhibition offers a representative sampling of current government building designs and demonstrates the contribution made by the private architect to the public buildings of today and tomorrow. Since the *Citation to an Organization* was recently awarded by the AIA to PBS in recognition of that agency's excellent procedures in selecting and working with private practitioners on Federal buildings, the present exhibition is particularly appropriate. This showing of contemporary work complements another PBS exhibition, "One Hundred Years of Federal Architecture" shown at the Octagon during the AIA Centennial celebration. The current exhibition contains the finished and accepted designs for 21 projects located across the nation.

"Retained percentage" procedures on construction contracts were the subject of a day-long discussion last month, between architects, sub-contractors, producers and surety bond experts at the Octagon. The meeting was called at the invitation of the AIA which was represented by six national officers and directors as well as the chairmen of national AIA committees concerned with construction industry problems. AIA president John Noble Richards, FAIA, chaired the meeting. Representatives of twelve national subcontractor organizations, building product companies, as well as of the Producer's Council and the Assn. of Casualty & Surety Co's., The Surety Assn. of America and the National Assn. of Credit Management and Dr. Robinson Newcomb, noted Washington economist, participated in the deliberations. The purpose of the meeting was to acquaint the officers and regional directors of AIA with the subcontractors' problems and views on "retained percentages," the amounts withheld from payment on any job as a protective cushion to assure completion of a job according to owner's and architect's specifications.

CEC/NSPE/ASCE news

The efforts of the *Consulting Engineers Council* to promote the use by the Federal Government of a single standardized engineer experience questionnaire for all Federal agencies appears to have produced results. Under the direction of the Bureau of the Budget, a standard form for procurement of architect and/or engineer services has been drawn up and distributed to the various interested agencies for comment. Copies of the proposed data form have been issued to all CEC Directors and Alternate Directors for their review with regard to format, content, and understandability. The suggestions for improvement have been referred to CEC Washington representative Lyle Jones, who tabulated and directed the answers to the Bureau of Budget for consideration in the preparation of a final draft. Publication of the adopted form is expected before the end of the year.

A resolution strongly endorsing the national highway construction program and urging its continuance without major alterations has been adopted by the Board of Direction of the *American Society of Civil Engineers.* The Society's resolution urged that the congressional reviews of the highway program be conducted objectively and with the full advice and counsel of qualified highway engineers. It added that these studies should be guided by engineering facts and economic considerations, to the end that this program may achieve its full potential in serving the economy, the national defense and the safety and welfare of the American people. The current highway construction program was authorized initially in 1956 and has been extended by subsequent legislation enacted in 1958 and again in 1959.

An *Industrial Professional Development Award* will be presented annually by the *National Society of Professional Engineers* to the industrial

organization employing engineering personnel, which has made an outstanding contribution to the advancement and improvement of the engineering profession through its employment practices. The first award will be made at the Society's annual meeting in June, 1960, in Boston. In announcing the award, NSPE president Harold A. Mosher stated that the purpose of the Award was two-fold: (1) to encourage advanced employment criteria (2) to enlargen opportunities for professional growth among engineers employed in industry. All interested organizations are invited to cooperate with local NSPE chapters in furnishing information and supporting data.

As a result of official encouragement, nearly 400 of the staff of 628 engineers of the Bureau of Reclamation's Engineering Center at Denver, Colo., are now registered professional engineers. The record was achieved with the cooperation of the *Professional Engineers of Colorado*, the affiliated state society of NSPE, and the efficient handling of hundreds of applications by the Colorado State Board of Registration for Professional Engineers and Land Surveyors.

According to the Bureau's official announcement, the listing of registered engineers is prominently displayed in the Denver office. To give additional recognition and prestige to the registered engineers, they are also encouraged to display registration certificates in their offices as evidence of professional qualification and technical competence.

Education

Applications for the 1960 Lloyd Warren Paris Prize Fellowship should be filed before January 1, 1960 according to an announcement of the *National Institute for Architectural Education*. The coveted architectural student fellowship carries a stipend of $5,000 for 12 months of travel in the U.S. and abroad. Students of architecture under the age of 30 may apply to the NIAE, 115 East 40th St., New York 16, N.Y.

Alan T. Waterman, National Science Foundation Director has announced that applications are being accepted for *National Science Foundation Graduate Fellowship* awards for advanced study in the sciences. Fellowships will be awarded in a number of scientific areas including the engi-

(Continued on page 8)

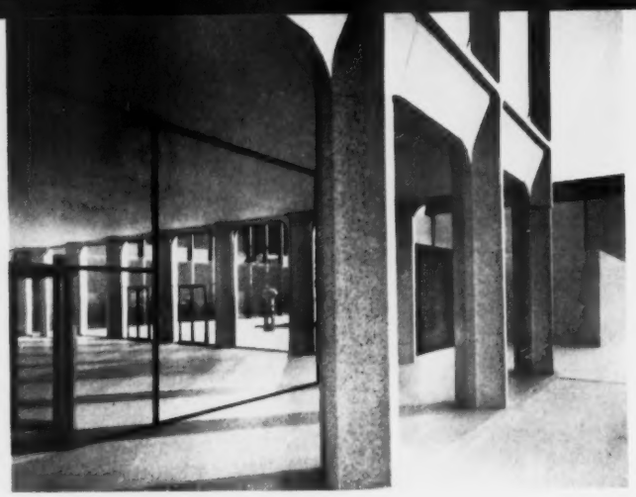
Tuckahoe Junior High School, Henrico County, Va. *Principal:* I. Herbert Levenson; *Architects:* Commonwealth Engineers and Architects, Godwin W. Draper; *Construction superintendent:* George L. Eitel; *General contractor:* Ivy Construction Corporation, Charlottesville, Va.; *Panel distributor:* Sash, Door & Glass Corporation, Richmond, Va.; *Installer:* N. W. Martin & Brothers, Richmond, Va.

ae news

(Continued from page 7)

neering sciences and also interdisciplinary fields which are comprised of overlapping fields among two or more sciences. Fellows will be selected on the basis of ability as attested by letters of recommendation, academic records, and other evidences of attainment. Inquiries should be directed to the National Science Foundation, 1951 Constitution Ave., N.W., Washington 25, D.C. The National Science Foundation has announced the award of 35 fellowships for advanced study and research in the sciences in the Foundation's *Postdoctoral Fellowship Program*. The Postdoctoral Fellows receive an annual stipend of $4,500, an allowance for dependents, and a limited allowance to aid in defraying the cost of travel to the affiliated institution. These awards will enable the recipients to study or carry on their research at 18 institutions in the United States and in 17 foreign institutions. The National Science Foundation is at present accepting applications for awards to be made in March 1960 in its Graduate and Postdoctoral Fellowship Programs.

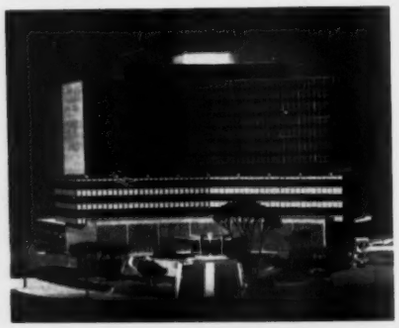
Effects of scientific research and development on economic and social life are being examined in more than 100 studies currently being made by U.S. colleges and universities, the National Science Foundation disclosed last month. A newly released Foundation publication, *Current Projects on the Economic and Other Impacts of Scientific Research and Development, 1959*, describes the nature, objectives, scope and principal research methods of the studies. A summary of each of 107 projects is presented. Concurrently with the issuance of this report, the Foundation has released a *Bibliography on the Economic and Social Implications of Scientific Research and Development*, a selected, annotated compilation of references to studies of scientific research and development. Listed items concern economic, social, political, and statistical aspects of research and development. Copies of both publications are available from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a cost of 25 cents each.



New York's Museum of Modern Art, in embarking upon a $25 million public fund raising campaign, announced plans for a new wing to be built on West 54th St. between Canada House and the Museum Sculpture Garden. This new facility designed by Philip Johnson, AIA, and Associates will enable the Museum to make its entire unique collection accessible to the public either in exhibition galleries or in study-storage for the first time in history. The Museum, in appealing to the public for much-needed funds, stresses that its institutional programs receive no government subsidy and that costs of its educational activities and services are met by contributions from patron gifts and other friends in various communities in all parts of the country. The new wing, will be an 8-story building on a site approximately 113 feet by 100 feet. The five gallery floors will be free of columns permitting maximum flexibility for exhibition. Service units will be in a utility band on the south and east. Escalators as well as elevators will connect gallery floors. A glass-enclosed corridor will link the new section with the older.

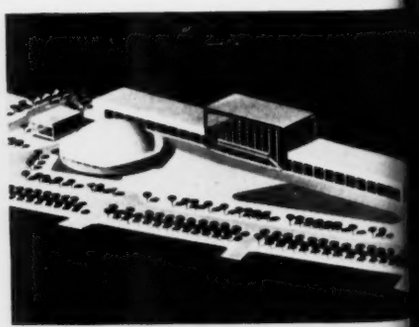
The Rhode Island School of Design's new $2.5 million women's dormitories and dining hall were designed by Architects Robinson, Green and Beretta of Providence with Pietro Belluschi, FAIA, Dean of the School of Architecture at MIT as consulting architect. The new buildings are the first units of a ten-year building program designed to transfer R.I.S.D. into a residential college. The Refectory (Dining Hall) shown here, seats 400 persons in the self-service cafeteria. To the left of the dining hall is part of the women's dormitory.

The newly completed Philip Morris Research Center near Richmond, Va., features a complex of buildings designed to provide an environment conducive to scientific research. The Administration Building (shown here) utilizes a free-standing steel frame resting on a podium of native Virginia Crab Orchard stone and concrete. Its exterior walls are glass set in from the roof line providing a shaded colonnade on the four sides of the building. Architect for the project is Ulrich Franzen, AIA, of New York City.



13-story motor-hotel for Norfolk, Va., Golden Triangle Hotel will be competed in late 1960 at estimated cost of $5 million. Structure will provide 361 units, 144 of which will be motel type, located in two 2-story extensions projecting from rear of main building. Architects are Anthony F. Musolino & Associate of Falls Church, Va., with Morris Lapidus, Kornblath, Harle & Liebman, Consulting Architects of New York.

Architect's model (above) shows the 200-foot stressed skin aluminum dome of the Palais des Sports and related buildings which will be erected near Porte de Versailles in Paris, France. The dome, fabricated by Kaiser Aluminum, will provide 30,000 square feet of clear-span floor area. This structure will be integrated into an original unit designed by Architect Pierre Dufau. Construction of the complex is already under way.



Construction of an office and warehouse facility early in 1960 in Los Angeles has been announced by Parke-Davis Co. Initial increment of 7,500 square feet of office space and 32,000 square feet of warehousing will be designed by Charles Luckman Associates, planning-architecture-engineering firm of Los Angeles. Estimated construction cost of the project is $600,000.

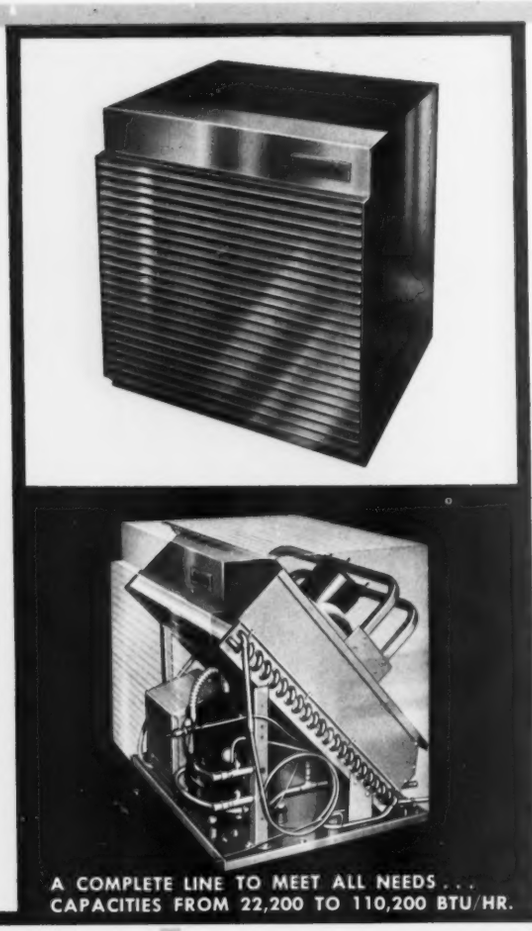
presents
the new and
versatile

A PRACTICAL APPROACH TO ECONOMICAL,
HIGH EFFICIENCY COOLING FOR COMMERCIAL—
INDUSTRIAL BUILDINGS . . .

UNCHALLENGED COOLING PERFORMANCE...

in all-new JANITROL

52 SERIES CONDENSING UNITS



A COMPLETE LINE TO MEET ALL NEEDS . . .
CAPACITIES FROM 22,200 TO 110,200 BTU/HR.

Outwardly beautiful and pleasing to the eye, inwardly rugged and powerful, new Janitrol 52 Series provides low-cost central cooling with matchless reliability and efficiency. Here are some of the many ways new Janitrol 52 Series condensing units are demonstrating their excellence . . .

In Performance . . . condensing coils have greater area to dissipate more heat and to provide higher efficiency. Operation with outside temperatures as high as 125°F.

In Styling . . . modern, simple and functional cabinet that will be in the best of taste in any landscape plan. Finished in beautiful, durable, weather-resistant, automotive-type enamel.

In Economy . . . powerful, top-mounted fan draws in quantities of cooler ground air over the condensing coil, which is shaded from the sun's heat by louvers.

In Quietness . . . compressor and fan are unusually quiet in operation. Cabinet is acoustically treated with a weatherproof, sound-absorbent material.

In Safety . . . upflow exhaust protects nearby plants from hot blasts . . . enclosing grilles safeguard pets and children.

In Service . . . all components are easily accessible. Service panels may be removed without affecting operation, to make checks while unit is in full operation.

A.R.I. CERTIFIED

Full A.R.I. certification is your assurance this equipment meets or exceeds standards of the Air Conditioning and Refrigeration Institute. A five-year written warranty backs up your choice.

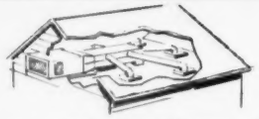
JANITROL AIR-COOLED SUMMER AND YEAR 'ROUND COMFORT SYSTEMS TO MEET ALL NEEDS

Janitrol Win-Sum-Matic Year 'Round Systems

A complete central heating and cooling unit in a compact, smartly-styled cabinet smaller than most home refrigerators! Features air-cooled summer cooling, thrifty gas heat with Dura-Tube heating heart, guaranteed for 20 years! Exclusive "Season Selector" control allows changing from heat to cool (or vice versa) in seconds. No special tools or service call needed.

Janitrol Add-On Cooling System

With Janitrol Add-On Cooling, most any forced air furnace can be easily adapted to circulate cool, filtered air to every room in the home. The Janitrol evaporator coil is installed in furnace outlet duct and connected to the properly-sized 52 Series condensing unit. The existing furnace blower and duct system circulates the cooled, dehumidified air. Here's full central air conditioning at low, low cost!



New Janitrol J-Line Self-Contained Air Conditioners

The Janitrol J-Line models are an economical answer to cooling needs. In one compact unit are the blower, compressor and evaporator coils. Operation is remarkably quiet. May be used with ducts or as free discharge. Installs through walls in crawl space, in attic or other limited access locations.

Janitrol Schoolroom Cooling and Heating

Janitrol offers a self-contained room heating and ventilating system (with optional cooling) that features perimeter-type, draftless air distribution. Installation economies are noteworthy (savings up to 60% over large central systems). For new schools, additions and modernization.

WRITE TODAY!

for complete information on Janitrol heating and cooling systems for your business needs. Remember—architects and engineers can specify . . . and dealers can recommend and install *Janitrol* equipment with complete confidence it will provide the finest, most carefree performance possible.

JANITROL

HEATING AND AIR CONDITIONING

A Division of Midland-Ross Corporation

Columbus 16, Ohio • In Canada: Maffats Ltd., Toronto 15

ARCHITECT ENGINEER RELATIONS

*by Clinton H. Cowgill, FAIA, and A. W. Green**

Reprinted through the courtesy of The Journal of The American Institute of Architects *and its Editor, Joseph Watterson, AIA.*

Are relations between architects and engineers deteriorating? Should discussion of this delicate subject be avoided so as to not stir things up? Can professional societies do anything to improve the present situation? If there is friction, an examination of reasons for it should do no harm and it might be beneficial.

The two professions do have much in common. In antiquity, the engineer, as well as the science upon which his work is based, was unknown, and the architect was both designer and builder. Later, when engineering work was undertaken, all engineers were classified as either civil or military, and the architect continued in his role of master builder. The development of engineering was marked by the establishment of specialized branches—mining, mechanical, electrical, structural, chemical, ceramic, automotive, aeronautical, agricultural, highway, railway, electronic, concrete, timber, etc. During this time, the design of buildings became increasingly involved with engineering, and architects were expected to be competent to design the structure and equipment of many of their buildings. Some architects proved to be able even to do the engineering design of large and complicated buildings, but others sought the help of engineering specialists.

Since the scope of most of the recognized engineering branches included much which is not related to building, some of these specialists concentrated on the engineering design of buildings, and these engineers were sometimes known as architectural engineers. They were frequently graduates in one of the recognized engineering branches, but in some architectural schools, special curricula called "architectural engineering" were given. Curricula content varied—some included thorough work in building structures, and a grounding in engineering principles related to building. Many of their graduates tended to become engineering generalists rather than specialists. Close association between students in architecture and "architectural engineering" often resulted in sympathetic understanding. Currently, the term "architectural engineering" is disapproved by the AIA and substitution of the term "building engineer" is recommended.

Architectural firms using the help of engineering specialists and generalists do so in one or more of three ways: (1) making the engineer a partner; (2) engaging him as an employee; and (3) by contract as a consultant.

The first is most appropriate for an engineering generalist. While partnerships should always be entered into with caution and generally the number of partners should not be large, there have been many successful architectural firms with engineers as partners. The second method has the advantage of continuity of association with the firm (as does the first) and it is possible to make an employee responsible for his work by means of a written agreement. Status as an employee should not be considered demeaning—and under present tax laws, it may be advantageous economically. [See "What Kind of an Office," by Cowgill and Cousins, *AIA Journal*, May 1958.] By means of profit sharing, valuable employees may be recognized. Many architects prefer to engage engineers as consultants, with separate agreements for each project. This is especially advantageous for architectural firms without a large enough volume of work to keep each of the engineering specialists continuously busy.

For most buildings, the architect should serve as designer and as coordinator of the work of all who collaborate in their design and construction. For such structures as bridges, dams, and power plants, the positions of architect and engineer are reversed—the engineer should serve as designer and coordinator, and if an architect is employed, he should advise primarily on esthetics.

Not only must architects and engineers work together, but they are alike in many ways. Both are engaged in solving practical problems, which involve the study of conditions and requirements, and answer human needs. Both use available materials, and must be alert in judging the characteristics of materials and equipment before they have been thoroughly tested in use. Both must apply science and intuition in arriving at decisions based upon judgment. The result of the labors of architects and engineers is the creation of capital—making the world a better place in which to live.

Members of the architectural and engineering professions (perhaps partly as a result of the way they work) have similar attitudes. To receive satisfaction from their efforts, they must take pleasure in doing good. This is true to a degree of even those whose primary aim is to accumulate wealth. Also both are creative. Their imaginations work in different ways, one may be more utilitarian than the other, but both make reality of dreams.

The difference between the two professions should be recognized as well as the similarities. In engineering, greater emphasis is placed upon the application of mathematical and physical science. There is also a greater tendency to concentrate upon a narrow field. While it is necessary for an architect to understand most of the principles of engineering, engineers generally are more familiar with methods of engineering design and analysis. Even though an architect might be able to design an intricate structure, he would probably take much more time than would an engineer who does the same sort of thing more or less continuously. Since each profession attracts suitable persons, it may be expected that architects will be more imaginative than logical or organizational; and that engineers will excel in practical management and administration. There are many architects, however, who have succeeded in building up organizations of hundreds of persons which have produced designs of high quality.

Architects, from their function as generalists, usually are more facile than engineers in coordinating the efforts of a team. From the nature of the programs from which they work, they generally acquire a superior knowledge and more sympathetic understanding of human needs. While imagination is essential for both, the architect usually has richer creative gifts. Through his practice, an architect has an opportunity to develop a broader understanding of the work of collaborating specialists—engineers, planners, landscape designers, scientists, economists, sculptors, and painters. Finally, an architect must excel in planning and the esthetic design of buildings. If an engineer were able to do these two things in addition to his engineering work, he might properly call himself an architect.

The work of architects and engineers may also be distinguished by the nature of their production. Architecture consists of buildings for human use, while engineering structures are characterized by being used for technical or scientific processes. Architecture is concerned with people, and engineering is concerned with "engines" or "machines." Exceptions to this generalization do

(Continued on page 12)

* *The authors: Clinton H. Cowgill, FAIA, Secretary for Office Practice, The Octagon, AIA, Washington, D.C., Former Dean, School of Architecture, Virginia Polytechnic Institute and Editor of* The Handbook of Architectural Practice. *A. W. Green is an attorney-at-law in private practice in Pittsburgh, Pa.*

ARCHITECT-ENGINEER RELATIONS

(Continued from page 11)

not negate it.

Regardless of whether or not the relations between architects and engineers are deteriorating, it may be observed that as of now, these relations are generally good. Each profession has respect for the other, and few members of either profession wish to encroach upon the legitimate field of the other.

But some friction is apparent. Some engineers obviously doubt the ability of some architects to do the simple engineering problems which are a part of many an architectural project. Engineers, like anyone else, like to have their work recognized and they resent it when architects fail to give proper credit for engineers' work on a project. Perhaps the most infuriating (to engineers) is the practice (I hope of a very few architects) of accepting free engineering service from producers or distributors. Finally some complaint has been heard of architectural firms with a full staff of engineers undertaking engineering projects. If such a firm is known as "architects and engineers," and has an engineer as one of the principals, there could be little objection.

While architects seldom wander far afield, the principal complaint of architects against engineers is their encroachment upon the architects' field. Resentment against this encroachment is not wholly selfish. There is ample reason for doubt concerning an engineer's competence to serve as an architect. If an exceptional engineer proved such competence, he should be registered as an architect.

There is danger that, if engineers were allowed to practice architecture, they would soon nullify architectural registration laws, because the qualifications for registration as an engineer are generally lower than those for registration as an architect. Most engineering curricula provide for only four years of collegiate education as against the standard five years for an architectural degree. Also, the registration examinations for engineers are frequently much less difficult than those for architects.

Would it be best for everyone—professionals and public—if engineers offered a low quality of architectural service, presumably for a small compensation? It would not increase the esteem with which the engineering profession is held by the public.

Both architects and engineers should join in opposition to incompetent purveyors of technical service. They are essentially promoters, who regard both architecture and engineering as businesses rather than professions. They look upon professional competence as a commodity which may be bought and sold, and upon professional registration laws as only an unfortunate hindrance. They do not have the wisdom to accept personal responsibility for either architectural or engineering decisions, but they often have political influence—sometimes as a result of unethical relations with unscrupulous politicians. They have even sought to evade legal responsibility by incorporation.

Let us suppose that reasons for friction between architects and engineers are not removed, and that undisguised contention ensues. Who would most likely come out ahead? The total number of engineers is much greater than the total of architects. Figures are not available, but if only professional engineers were counted the numbers of the two groups probably wouldn't be much different. More important than numbers, though, are prominence and the extent of political activity. The fact that architects employ engineers may affect the attitudes of these engineers in ways it is difficult to predict.

Contention may take many forms. Publication of inflammatory articles or editorials in professional journals is self-defeating. The obvious way for one profession to take advantage of the other is through legislation—registration laws, and local building codes and regulations. But engineers and architects should remember that both groups are relatively so small that separately they can carry little political weight. Also, it is generally recognized that it is much easier to get proposed legislation killed than it is to get it passed. Working at cross purposes, therefore, it is probable that either the architects or the engineers could nullify the efforts of the other group. It would be unrealistic, though, not to recognize that over the years, engineers have been more successful politically than architects.

If, as most of us agree, contention is likely to be unfruitful, what can be done? First, each profession can make a special effort to understand

---

INTERPROFESSIONAL PRINCIPLES OF PRACTICE FOR ARCHITECTS AND ENGINEERS*

1. Preamble

Architecture and engineering are learned professions legally recognized in each state to promote the public welfare and safeguard life, health, and property.

It is a matter of public interest that these professions discharge their professional responsibilities with such fidelity to their clients and the public as to warrant the utmost confidence.

Furthermore, it is incumbent upon these professions to prevent confusion in the layman's mind in these similar or overlapping fields of professional practice.

2. The practice of architecture and engineering

An architect or engineer may ethically accept commissions for projects embracing both architectural and engineering work, provided he is competent to do the type of work involved, or provided he will employ other registered architects or engineers who are competent in those phases of the projects in which he lacks proficiency.

The client's interests normally are served best when the principal retained is proficient in the predominant work involved in the project. Recognition for their responsibility shall be granted to the architects or engineers executing separate phases of the project as associates of the principal.

3. Mutual relations

Architects and engineers shall undertake to design only those phases of a project in which they are proficient and shall retain professional associates for those parts in which they lack proficiency.

The professions shall maintain effective and dignified cooperation in their public statements, exchange of information, and assistance to students of the professions.

Joint Committees of Architects and Engineers shall be encouraged at state and local levels to promote greater understanding and cooperation on the many common problems for the mutual benefit of both professions and in the welfare of the public.

4. Public responsibility

Both professions shall interest themselves in public improvements and shall utilize their special talents (in bringing them about). They shall, however, require that professional services for public improvements be obtained at equitable fees.

5. Relations with manufacturers

The professions may freely use the specialized services of manufacturers for integration into their designs, but shall oppose general architectural or engineering design by manufacturers or their sales representatives as being inherently biased and, therefore, not in the best interest of the client.

6. Individual obligations of the architect and engineer

Professional service, performed singly or in collaboration entails exhaustive study and research in preparation for the solution of the problem, the careful application of talent to sound planning and design and the highest integrity in guarding the client's interest. By its very nature the rendering of professional services by the Design Professions must be on a highly ethical and professional basis. It is presupposed that the collaborators will perform their services in a cooperative manner with competence and efficiency and in full compliance with the "Code of Ethics" of the various professions.

** This document was developed by the AIA-Engineers Joint Council Committee.*

both professions. All engineers should follow the lead of the most prominent firms in recognizing their limitations—particularly in planning and esthetics. They should accept the architect as the coordinator of architectural projects, and as the one who is normally responsible for the engineer's work on a project, making final decisions.

Architects must also admit their limitations, particularly in engineering and science. An architect should accept the engineer as coordinator for engineering structures. He should develop an understanding of engineering design and analysis, however, as well as of the possibilities of engineering devices.

Positive steps to improve relations between these two professions are of two kinds: (1) those which clarify the fields of practice; and (2) those which increase professional contacts.

Agreements concerning fields of practice may be local, state, regional or national. They should be specific regarding types of buildings. Since agreements are most easily reached among friends, local action may well come first. The various points of view should be expressed by those in a single office or who work upon a single project. When agreements are reached in the various offices, formal statements might be presented for action by informal groups in each locality, and later the results of such action might be discussed and ratified by the local AIA chapters and local engineering societies. In due time, such agreements should be presented to state organizations as a preliminary to the formulation of suitable amendments to the state registration laws. During this time, it would be well if regional and national organizations of the AIA and engineering societies received and acted upon reports from the various state organizations, so that each state organization could be kept informed of action by all other state organizations. Advice from the various state registration boards, the National Council of Architectural Registration Boards, and the National Council of State Boards of Engineering Examiners should be sought at each stage. Legislation regulating the practice of either architecture or engineering should never be introduced without the support of both architects and engineers.

Increasing contacts between architects and engineers could either increase or decrease friction, but in time the understanding which should result from open-minded discussion should improve relations. Intersociety meetings have been held in Virginia and the relations between architects and engineers have been notably good in Virginia. Programs of engineers' meetings frequently include items of interest to architects, and also social hours which give an opportunity for the development of friendships. Engineers should be welcomed to meetings of AIA chapters and state organizations. Special recognition should be tendered by the AIA to those professional engineers who specialize in buildings. They frequently have more in common with architects than with other engineers.

Current modular standards

by Cyrus E. Silling, FAIA, C.E. Silling and Associates, Architects. Mr. Silling is President of the Modular Building Standards Assn. and one of AIA's appointed participating members of BRI.

Time establishes patterns that scholars identify as "historical events." About 12 years ago, one of our men studied the drafting advantages of Modular Measure at home for a few evenings; then presented his startling conclusions to me on its potential for added office profits.

One Saturday morning we explained Modular Measure drafting simplicities to our handful of reasonably knowledgeable people. On the following Monday, our drafting room was converted to Modular Measure. The year was 1948. Modular Measure and high profits have been the constant rule of our office ever since. Modular materials and nonmodular materials, all are grist to our modular mill.

With never more than six active drafting boards, often less, we regularly digest $12 to $20 million in annual work load; and once we were fortunate enough to have a $30 million Medical Center. Our people find all this entertaining phenomena. They share in the added profits.

Other engaging phenomena have come to light. During bidding periods, contractors' estimators have volunteered compliments to us on the simplicity and clarity of our documents, have said their take-offs for labor and materials move faster, more accurately on our work. Masonry sub-contractors began to confess to inordinate profits on our jobs, and quietly followed our work with sharper prices to their favorite general contractors who were bidding it. This has spread to mechanical contractors. They became bolder in the extent of their prefabrication when performing on our jobs. Other subcontractors have followed suit. And through this chain of advantageous competitive circumstances, our owners have received sharper overall project costs. For instance: our $10,675,000 highly technical laboratory building with five bids in a total spread of $19,000 on plans drawn at 1/16" scale; or our $13,500,000 hospital estimate awarded for a bonded contract at $13,172,000 with six bids in that spread, and again with 1/16" scale drawings; or our recent $8,888,000 estimate on agriculture and engineering buildings awarded for $8,827,000.

There are many other architects with similar experience. One of them is Architect Smith from Birmingham, Mich., who is currently AIA Regional Director for the Great Lakes Region serving on the National AIA Board—an effective platform for Modular appeal to the remaining reluctant architectural dragons among us.

From the foregoing, it is possible to conclude that the building industry elements who presently share least in these modular profits, and whose public contribution to our expanding economy is somewhat out of balance in consequence, are those producers of building materials who have shown a lesser interest in Modular Measure, and its standardization values wherein the implication is to cut product costs, and thus invite a larger market for their products.

The chronological progress of Modular Measure may be of interest:

1921 First research on modular practices.

1936 Publication of the "Evolving House by A. F. Bemis wherein he stated his conclusion that 4" provided the largest dimensional increment for minimizing problems in connection with stocking and distributing building products while satisfying the designer's need for flexibility to meet specific requirements, both practical and aesthetic.

1938 Establishment of Committee A62 of the American Standards Association.

1939 AIA and Producer's Council became co-sponsors of ASA Committee A62.

1945 4" module adopted by ASA as the American Standard.

1946 A62 Guide was published.

1948 Modular Service Assn. closed for lack of funds.

1949 AIA then housed "Modular Coordinator" William Demarest for a period of years.

1949 HHFA conducted an educational program on Modular Measure with government funds.

1950 NAHB became the third sponsor of ASA Committee A62 activities.

1954 BRI held a conference on Modular Coordination.

1956 Office of Modular Coordinator was closed by AIA for lack of funds.

1956 AGCA became the fourth sponsor of ASA Committee A62 activities.

1957 Modular Building Standards Assn. was formed under sponsorship of The American Institute of Architects, the Associated General Contractors of America, National Assn. of Home Builders and Producer's Council, Inc.

From this historical base Modular Measure has spread through Canada, Europe and Australia, the 4" module in "foot-inch" countries, the 10 centimeter module for "metric measure" countries. Four inches and ten centimeters are so close to the same size—they are interchangeable in the lower range of multiples.

In England, scientific and methodical study has been given the subject in government-sponsored and highly respected offices of the British Research Station. Conscientious, exhaustive efforts were applied to a series of studies relating to a mathematical series of combinations of numbers to enable practical ranges of sizes for production of panels and other building products, while effecting economies in production and erection, and to provide the architect with adequate flexibility to meet his plan function and design needs. These studies were termed, "number-pattern" studies, which were comprehensively and authoritatively investigated. The Secretary of the Modular Society of England states, "the introduction of the 4" module gave a brilliantly simple answer to the manufacturer's problem and to the architect's at a single stroke. That is why its acceptance was so rapid, once its purport was understood."

As far as I know, the Modular Society of England, the Modular Building Standards Assn. of the United States and a recently formed Australian Modular Society represent the only such organi-

4X4

The arrow, the dot, and the grid are the working tools of modular coordination in contemporary building practice. A workshop of the Building Research Institute recently held in Washington brought together four experts on the subject under the chairmanship of William H. Scheick, AIA, Vice-President of the Timber Engineering Co. A/E NEWS presents a roundup of excerpted comment from several of the papers delivered at this conference.

zations from among the dozens of countries actively programming modular efforts that operate without government support. England has a department for modular coordination studies within her government-supported British Research Station, leaving the United States as the only country with its past inter-industry work being performed through industry representatives solely on industry support.

U. S. industry technicians, reviewing modular installation requirements for their products are, by far, the most competent people to advise manufacturers on the sizes and ranges of modular products that each should produce. We have study committees set up in which every element of industry can function in its own interest. We welcome and solicit that cooperative effort.

The Corps of Engineers has required modular dimensioning on all their building projects during the last 4 years. The Veterans Administration, this year, converted to modular practices in its own hospital program. Other government agencies conducting construction programs establish "standards of use" for modular products through modular construction. Many Commercial Standards adopted by industry through the Commodity Standards Division of the Department of Commerce are indeed modular.

The standards program for specific categories of building products has suffered from financial anemia for many years. The lack of funds to provide a full-time technical staff to coordinate standards activities has been the sole source of frustration for some 15 study committees in not achieving formally adopted American Standards for their areas of interest. When MBSA was staffed in September of 1958 it had to find the solution to a means of financial support for technical staff to work with building industry personnel towards standards development.

The reconstituted ASA A62 Executive Committee met in March of this year to outline the scope of standards work to be done. The Committee developed a streamlined procedure for rapid adoption of sub-committee proposals. It outlined the following needed areas for standards to be developed and adopted as American Standards:

Subcommittee 1. Manufactured Masonry Units. Structural Clay Products, Concrete Gypsum and Masonry made of concrete.

Subcommittee 2. Doors. Metal and wood doors, and other materials.

Subcommittee 3. Windows. Metal and wood windows and accessories.

Subcommittee 4. Natural Stones.

Subcommittee 5. Cast Stone.

Subcommittee 6. Structural Wood.

Subcommittee 7. Structural Steel.

Subcommittee 8. Miscellaneous Metal Products (except doors and windows).

Subcommittee 9. Glass Products.

Subcommittee 10. Domestic Kitchen and Laundry Equipment (appliances, cabinets).

Subcommittee 11. Manufactured Toilet Partitions, Shower Stalls.

Subcommittee 12. Integrated Ceilings.

The MBSA staff is assigned the task of providing secretariat services to ASA A62 activities. We decided to defer active standards developments until we had solved the financial problem that had continuously harassed the program over the last fifteen years. The current four-sponsor financial support, coupled with membership fees from individual members and firms within the construction industry, permits us now to move ahead on standards activities during 1960. We've had a procedural package for A62 committee activities well prepared and on file awaiting this opportunity. You may look forward to more activity in this area in 1960.

Status of modular practices

by Byron C. Bloomfield, AIA, Executive Director, Modular Building Standards Assn.

The most serious of all problems in connection with expanding the use of modular principles to the point of becoming universal practice throughout the construction industry has been the human element involved in getting busy decision-making executives to review the situation. Among these harassed executives are architects, builders, contractors, manufacturing marketing specialists as well as the many technical research and development engineers connected with decisions related to the dimensional properties of new materials and their incorporation into new building projects. Perhaps you would like to see just how busy [this executive group] really is: *(Figure 1.)*.

Figure 1: TIME EXECUTIVES SPEND ON THE JOB

ON THE JOB	HRS./WK.
AT OFFICE OR PLACE OF BUSINESS	42.7
AT HOME: PAPER WORK, ETC.	6.8
BUSINESS ENTERTAINING	2.6
TRAVEL BETWEEN HOME & OFFICE	5.3
BUSINESS-SOCIAL FUNCTIONS OUTSIDE HOME	2.8
BUSINESS TRAVEL	6.6
TOTAL HOURS AT WORK	66.8

This table was reproduced from the *Newsletter*, published by the Twentieth Century Fund as a portion of a study currently being conducted by the *Harvard Business Review* and the Twentieth Century Fund. With a 66.8 hour week, it merely demonstrates that the executive group represents the hardest-working class in America today and the hardest to reach with information that may suggest a better way of doing things. Specifically, it demonstrates the need for my remarks to be brief, factual, and with only sufficient background information to validate the summary findings.

Architect's use

One word of caution, however, before proceeding: My remarks relate to the architect's use of *modular dimensioning* as a practical tool for simplifying drafting requirement on modular projects, and in no way can be considered as a prerequisite to the architect's incorporation of modular products into building projects. Architectural specification of modular materials and the planning for incorporation of such products outdistances the current usage of modular dimensioning by a ratio exceeding 6 to 1. To proceed with the report, here is the information many architects have been asking for:

QUESTION: On what percentage of current building projects in architectural offices in the United States are the working drawing documents being prepared using "modular dimensioning?"

ANSWER: The percentage in March, 1959 was 11 per cent. This amazingly high percentage correlates well with an earlier survey conducted by the Office Practice Committee of the American Institute of Architects in 1956. The first question pertinent to modular dimensioning in their survey with returns from 2,043 architectural firms was, "On what percentage of your projects do you dimension working drawings in "Modular Measure" by indicating the 4" modular grid on large scale details?"

To architects using modular dimensioning, response to the AIA question will be inherently conservative because many such firms do not actually show the grid on large-scale details, although their drawings are completely modular. The AIA statistics conservatively indicated that modular dimensioning was used in about 7½ per cent of new projects in 1956.

When the *Modular Building Standards Assn.* was staffed last year, the need became apparent for an actual head count on the number of new projects constructed from modular drawings. A simple questionnaire was drafted and mailed to the architects of all new projects estimated at $50,000 or more, reported as out-for-bids during the month of March, 1959. The source for the inquiries was all such reports in the 37 state coverage of the Dodge Construction Reports service. Architects of 1,713 projects received the questionnaire. 918 were returned. With this astounding 54 per cent response, the need for a conventional survey "follow-up" was obviated! A return card from one architect even carried the polite and appreciated message, "Thank you."

Of the 918 returns, 102 architects responded "yes" to the question, "Was 'modular drafting' used for your working drawings on the above project? (arrowheads for 4" nominal increments and dots for off-grid dimensions)"—yielding the 11 per cent figure mentioned earlier. This is obviously not theory, nor wishful thinking. From the survey we now know the name of the architect, the name of the job, the location, and in most cases the estimated cost of 102 architectural projects with modular dimensioned working drawings. Geographic distribution of relative usage of modular dimensioning was interesting. *(Figure 2.)*.

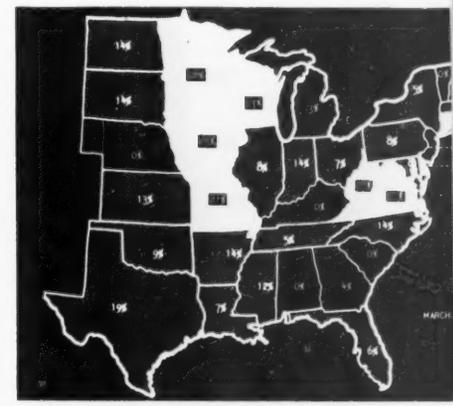


Figure 2: Percentage of architectural projects employing modular dimensioning on working drawings (as of March 1959).

While any one state does not have a sufficient number of returns to justify a statistical percentage as "typical of the State," the chart gives us a few obvious clues on how, why, and where modular dimensioning is being adopted by architectural firms as standard office procedure. The grey areas denote those in the *present average* or 10 per cent usage range. The black denotes those below 5 per cent and the white indicates states reporting 20 per cent and above in the returns. Notice the midwestern belt and also the East Coast highlights of current usage. Variations in application to different building types was considerably less than expected:

Figure 3: FREQUENCY OF APPLICATION OF MODULAR DIMENSIONING TO BUILDING PROJECTS BY TYPE:

TYPE OF PROJECT	PER CENT OF USE
MEDICAL FACILITIES	16%
EDUCATIONAL	14%
RESIDENTIAL	14%
RELIGIOUS	10%
INDUSTRIAL	10%
COMMERCIAL	6%
MISCELLANEOUS	5%

Highest, not surprisingly, were Medical facilities influenced early by the U. S. Corps of Engineers administration and recently by the Veterans Administration staff, followed closely by educational and residential. Application to industrial projects ranked definitely lower

(Continued on page 16)

Figure 3: Tullulah Falls Elementary School. Georgia; Architect: Aeck and Associates (Photo: Rodney McCay Morgan-Photolog).

Figure 4: Herrick Iron Works, Hayward, Calif.; Architect: John Carl Warnecke and Associates (Photo: Dandelet Photographers).

Figure 5: Lansing Elementary School, Ludlowville, N. Y.; Architect: Sargent, Webster, Crenshaw and Folley, Syracuse, N. Y. (Photo: J. W. Molitor).

Figure 6: First E.U.B. Church, Canton, Ohio; Architect: Lawrence, Dykes and Associates, Canton, Ohio. Mechanical Engr: Schweitzer, Heapy & Associate, Dayton, Ohio; Structural Engr.: Gensert, Williams and Associates, Cleveland, Ohio (Photo: Jack Sterling).

Figure 7: Princeton High School; Architect: Potter, Tyler, Martin & Roth, Cincinnati, Ohio (Photo: George Stille).

4 X 4

(Continued from page 15)

than expected while commercial skimmed the miscellaneous category.

Another question had to be answered before we knew where we were on the road of acceptance of modular dimensioning practices.

QUESTIONS: How many architectural firms had ever tried modular dimensioning?

The answer was framed into the MBSA Survey as, "Have you used modular dimensioning for any of your other projects?"

The answer came back that only 37 per cent of the architectural firms had ever even tried modular dimensioning! Of these, we knew that 11 per cent of the jobs were modular, leaving a balance of only 26 per cent of the firms. Out of this fourth of the offices we know that a good number do not use modular dimensioning on all of their projects—leaving a very, very, small percentage of architectural offices that have actually taken the time to give modular dimensioning an honest evaluation through trial.

Another way to look at this problem was reported in the July issue of the Monthly Bulletin of the Michigan Society of Architects. They want to know: *QUESTION:* Of architects that ever tried modular dimensioning, what percentage continued using it?

Thirty-three questionnaires were returned to C. H. MacMahon, Chairman of the Committee on Office Practice of the Detroit AIA Chapter from the 100 sent out. Mr. MacMahon reports, "We think it is significant that of all the offices who have tried the system, 85 per cent are still using it."

A separate question in the Detroit survey was designed to bring out the advantages these 85 per cent offices that continued using the system felt they were receiving by using modular drafting. In order of voluntary individual identification and description, they were categorized in the following order:

1. Simplified drafting
2. Construction efficiency
3. Economy of materials
4. Planning and area computation
5. Lower cost of construction
6. Improved field referencing
7. Improved masonry appearance
8. Reduced errors
9. Less waste during construction

What does all this mean? One may surmise many things: First: *That the progression of adoption of modular drafting practices by individual practitioners has gone unnoticed.* It is not a type of activity that arouses the building industry press. No one publishes the name of the architect converting his office to modular dimensioning. No one points at a new building and exclaims, "Now there's a *modular* building"! The reason he doesn't is perfectly simple. He can't tell by taking a blushing glance at the completed building. Modular dimensioned buildings look no different from any other commendable architectural work. Let's look at some. These projects all utilized modular dimensioning on the working drawings. (Figures *3-7).*

We suspect that the human factor definitely enters into the picture of adoption of modular building practices by architectural firms. This letter, from a mid-western architectural firm was among the 700 or 800 inquiries received during our first year of operation and may provide a clue:

Gentlemen:

We are planning to adopt the modular measure system of drafting in our office in the very near future. We have at the present time nine personnel involved in drafting with the expectation of adding about six more in the next year. Our office has averaged approximately five million dollars worth of work during the past two years. It has been our experience that efficiency has suffered during our expansion and from what we read the system of modular measure can help this situation. In addition, it appears to us that it is definitely the coming practice and we wish to adopt the system before we grow any larger. We also feel it has a place in our philosophy of architectural practice.

This letter may exemplify an observation we believe to be true—you can't get a reflection of the methodical increase in offices converting to modular drafting by going to New York and querying the ten largest firms! The growth seems to definitely stem from the grass-roots and the "average" architectural office of 8.3 men reported by the AIA as typical of the profession.

A second observation might be drawn from the Michigan Office Practice Survey: *Architects converting to modular drafting do not give up the advantages they have gained.* Except for a small minority of 15 per cent, they do not revert to their conventional dimensioning techniques. Conversion of architectural offices, as a category, is obviously a one-way process.

Thirdly, *conversion to modular dimensioning is much easier to effect in architectural offices now, than it has ever been in the past.* Many schools now graduate students versed in the use of the dot, the arrow and the grid. A high percentage of draftsmen have worked, at one time or another, in offices utilizing the system. The are familiar with these three tools: *(Figure 8).* They are familiar with the simplicities and principles inherent in their use.

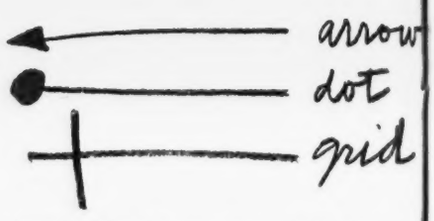


Figure 8: Tools of modular system: ARROW: used for dimensions related to location of grid lines exclusively. DOT: used for dimensional reference to points other than grid lines. Used only when essential to clarity of drawing. GRID: considered as occurring every 4 inches, horizontally and vertically, throughout structure. Shown on plans where dimensional reference points are required.

In closing, I should like to report an incident that recently took place on the campus of the University of Florida:

Professor James T. Lendrum, Head of that school's Department of Architecture was introducing the subject of Modular Measure to an assembly of 60 or 70 of his students. He mentioned, in his introductory remarks, "The personnel in an office in which I was working had no trouble making the decision on whether to convert to modular drafting. The boss just came in the drafting room one day, threw a roll of preliminaries on the table and said, "Use modular dimensioning—from now on we're modular!"

Modular product availability

by H. Dorn Stewart, President of the Producer's Council and President of the Barrett Div., Allied Chemical Corp.

Christened in the early thirties, Modular Coordination received its formal baptismal in 1945 in the sanctuary of the *American Standards Assn.* when it became the "American Standard" for all building products.

Many knowledgeable individuals speculated that the poor child would never amount to anything. They considered its role in life to be over-ambitious. "It required conversion of *all* materials to modular sizes before the market would support them," they said.

They reasoned that the architect would not convert in unison to request modular materials. So, they deduced that materials manufacturers would not produce modular materials until architects asked for them. And, "indeed—did you ever stop to consider the plant investment in converting production to modular sizes, or stocking conventional and modular sizes?"

The situation looked hopeless! Everyone accepted the reasoning that *ultimately* all manufacturers would benefit by conversion of the industry to modular practices through:

1. Reduced inventories
2. More economical production runs
3. Simplified shop drawings
4. Reduced set-up time for equipment
5. Reduced warehouse space

6. Reduced packing costs
7. Improved size control, and
8. Improved quality control

With goals such as these, how could producers resist conversion? Easy—

They reasoned, as manufacturers do that, "as soon as you, Mr. Architect, ask for modular materials, we (the manufacturers) will be only too happy to make them for you! Of course, we will have to add on a small price penalty for the special set-up and special handling, but we're only too happy to make it for you!

Naturally, no architect is willing to spend his client's money for the purpose of upgrading the construction industry! There seemed to be no solution, and the situation became likened to, "the chicken or the egg—which came first?" Modular materials, *or* demand for modular materials?

But today, I really think that period of speculative discussion is behind us! Although it may be a bit of a revelation to some who still entertain such arguments, I believe there is enough evidence to substantiate my use of the past-tense.

For a starter, let's take a look at some of the economic forces stimulating and shaping building product characteristics:

First, we were all completely hoodwinked by the logic of the chick-or-the-egg argument. It is a sound simile *only* if the construction industry were static. Of course, it is *not!*

As producers, we must constantly remind ourselves of the dynamic nature of the industry in which we are competitively engaged. As an example of what I mean by "dynamic," one major manufacturer of appliances expects his complete line of current production items to be superseded in seven years.

The same dynamic quality in changing patterns of new production items has been experienced by almost all manufacturers in the building industry. Sure, a few have not been affected—but very few! Who would have imagined that Portland Cement in dimensional precast unit would now enjoy several times as much usage as it did in 1945 when the American Standard was adopted? Add to this the tremendous quantity of cement used in poured-in-place floor and decking *on modular steel* panels and you have a fair glimpse of the changing character of the cement industry.

It wasn't long ago when timber products were cut-and-sawed on the job to meet specific building requirements. The phenomenal increase in production of finished dimensional products from the lumber industry truly underscores the dynamic quality of today's lumber industry. Today, we see reference even in our public newspapers alluding to the

(Continued on page 18)

4 X 4

(Continued from page 17)

changes in production, distribution and marketing of this most familiar building material.

Hundreds of specific examples [could be made] to illustrate the changing character of building products from producing and marketing raw materials to today's concept of supply of completed products ready for setting, nailing or bolting in place. Among such items we find many new modular faces peering at us from 1960 catalogues of trusted producers.

To mention only a few, new modular bathtubs from three different companies were introduced in 1958 and 1959. Two well-known steel producers recently introduced modular panels and components for school applications. Three major companies will be introducing finished wall panels into the 1960 residential market. Modular window assemblies including structural mullions, new forms of modular masonry units, modular lighting with integral mechanical functions, modular partitioning systems, and even the appliances have taken new dimensions. For example, one new thru-wall unit air conditioner has been noted to accommodate simplified installation in a modular masonry wall vertically and horizontally, as well as conforming to the requirements of modular spacing of studs.

The obvious logic of applying the only dimensional standards in existence to new products gives any manufacturer a keen competitive edge. Try out their reasoning:

A modular material will work where any non-modular material can be incorporated. Yet the converse is not true—*a non-modular material will not satisfy the requirements of modular construction!*

Architects are taking off their kid gloves! No longer are they individually asking us, "please Mr. Producer, how about producing modular sizes. It would be so nice to have them fit with other products."

When the 918 replies [of the MBSA Survey] were tabulated, it became almost embarrassing to producers playing the "wait-and-see" game. *Two out of three* architects had replied that they incorporate modular materials when available! Please notice I did not say they *specify* modular materials, because that brings up the subject of architectural office procedures and I want to destroy another myth that manufacturers commonly entertain about the manner in which their products become specified.

We manufacturers are often guilty of thinking our products are in the competitive running until the specifications are written and until the contractor has established the "or equal" requirements with the architect. This is true for a number of building materials, but—if the product is *dimensional*, as the preponderance of building materials are, your product will lose out on the draftsman's drawing board if it is not dimensionally compatible with adjacent materials from other manufacturers! When two out of three architects state categorically that they use modular products, this means your material lost out *before it ever got to the specification stage*, if it was not modular!

Interpretations from the 1956 AIA Office Practice Survey would lead us to believe that the current level of two-thirds of the architects planning for modular materials in 1959 had grown to that figure from about one-third to one-half of the architectural firms only three years ago.

Two concise and important implications can be drawn: First, the percentage of architectural firms planning for modular materials right now is astoundingly high and can be expected to move to 100 per cent rapidly. Secondly, and more important for producers, *if you are not now producing modular sizes, two-thirds of your market may have already evaporated!*

You (the manufacturers) are possibly wondering what corrective measures you can take with our own production items. I can list a few recommendations, some of which may apply to you:

1. Start by reviewing your own product catalogues. Check all items for dimensional characteristics required for *direct installation into buildings.*
2. Keep apprised of current modular developments.
3. Let architects and other specifying authorities know when your products are truly modular. It's only good business to simplify their search for products conforming to the ASA Standard.

As a matter of information, the problem of anyone, and everyone, claiming their products to be modular even when not in agreement with the 4" standard

MODULAR

Sizes in conformance with the recommendations of the MODULAR BUILDING STANDARDS ASSOCIATION

Figure 9: Identifying symbol for modular products.

has now been resolved by MBSA. *(Figure 9)* shows the identifying symbol. "*ModulaR*®, which is being incorporated into product literature for immediate recognition of truly modular products.

4. Last, but not least—convert to modular production as quickly as possible. Let your technical staff be your guide on the desired installation characteristics. Manufacture, produce, and market your products as *finished* items. Architects can, and will, find a way of by-passing your products if they are not modular.

products, equipment, materials

Reports of recent developments by industry, based on data furnished by mfrs. Inquiry cards for further information face pages 1 and 42.

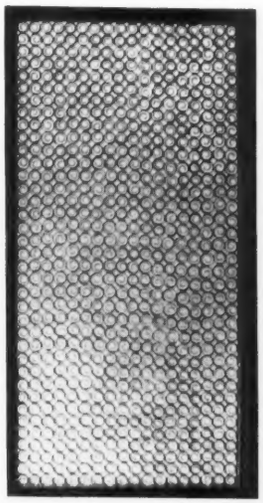
Low cost fibrous glass swimming pool

MFR'S DESCRIPTION: swimming pool of fibrous glass developed to sell for $2,500.

USES: residential installations.

SPECS/FEATURES: intended to permit more widespread enjoyment of advantages offered by pool. Installation time said to have been reduced.
AIA file no. 35-F-2

MFR: PRINCESS POOL DIV., WELDING ENGINEERING CO.
Circle 21 for further information



Translucent plastic panels with colors/patterns

MFR'S DESCRIPTION: *Tropicel* line of translucent plastic panels in color, with inset design pattern is offered.

USES: ceilings, partitions, skylighting, etc.

SPECS / FEATURES: outer surface is reinforced, shatterproof plastic; core is made of variety of materials, including wood strips, various sized tubing and honeycomb material. Permit passage of approximately 60 per cent of light. Available in sizes up to 11′ by 4′, in thicknesses from ⅜″ to 1½″. Basic colors number 22.
AIA file no. 26-A-9

MFR: NAUGATUCK CHEMICAL DIV., UNITED STATES RUBBER CO.
Circle 22 for further information

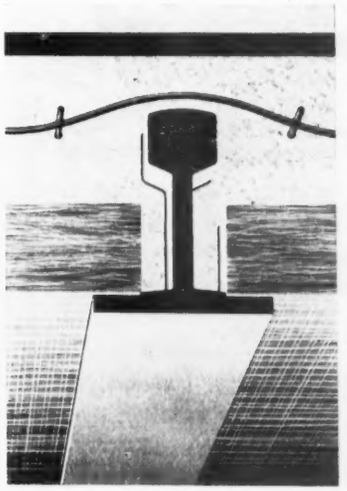
Blueprint measurer for accurate readings

MFR'S DESCRIPTION: novel blueprint measurer is available.

USES: in reading plans and blueprints.

SPECS/FEATURES: one side is scaled at ¼″-1′ and ½″-1′; reverse side at 3/16″=1′ and ⅜″=1′. Readings can be made directly from dial, without interpolation or calculation, according to mfr.
AIA file no. 35-H-3

MFR: AMERICAN MAP CO., INC.
Circle 23 for further information



Glass cloth board as construction form

MFR'S DESCRIPTION: glass cloth faced form board offered as permanent form in construction of poured in place gypsum and lightweight aggregate concrete roof decks.

USES: gymnasiums, low ceilinged areas, etc.

SPECS/FEATURES: stressed are thermal and acoustical qualities, fire safety, durability and ease of handling and installation. Standard size is 32″ x 48″ x 1″. Special sizes also available.
AIA file no. 4-D

MFR: OWENS-CORNING FIBERGLAS CORP.
Circle 24 for further information

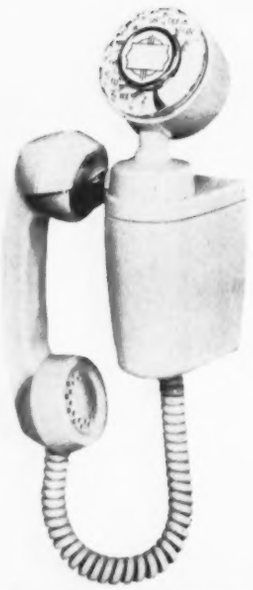
Telephone with greater mobility

MFR'S DESCRIPTION: *Space-Maker* telephone announced for versatile mounting.

USES: various interior installations.

SPECS/FEATURES: movable dial and hookswitch for mobility stressed. Dial mounting can be rotated 360°, tilted backward 45° and locked into place at any point. Handset cradle swings in 180° arc and locks in any of seven positions. Variety of mounting holes in unit's base permits mounting on desk, wall, any flat surface or on outlet box.
AIA file no. 31-i-5

MFR: GENERAL TELEPHONE LABORATORIES, SUBS. OF GENERAL TELEPHONE & ELECTRONICS
Circle 25 for further information



25 TELEPHONE WITH GREATER MOBILITY

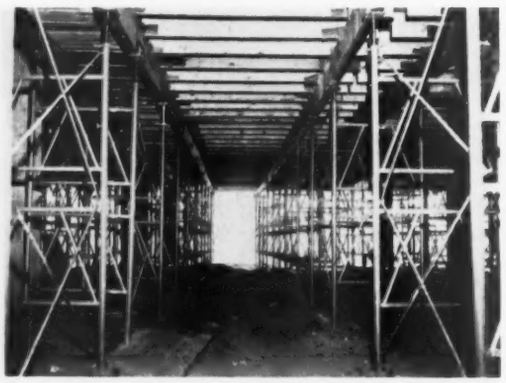
Tubular steel scaffolding with greater capacity

MFR'S DESCRIPTION: heavy duty, tubular steel frame shoring line is introduced.

USES: construction, remodeling, etc.

SPECS/FEATURES: line said to combine load capacity of post-type shores with stability and erection efficiency of frame-type scaffolding. Mfr claims each frame safely carries up to 20,000 lbs. Frames available in heights of 3½', 5' and 6½'
AIA file no. 36-E

MFR: SAFWAY STEEL PRODUCTS, INC.
Circle 26 for further information



26 TUBULAR STEEL SCAFFOLDING WITH GREATER CAPACITY

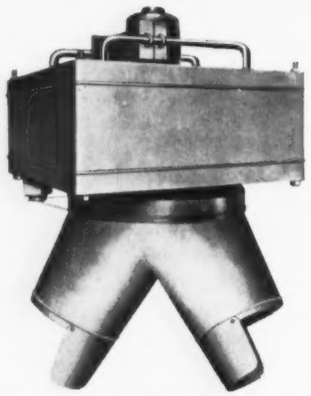
Modular electronic fueling system

MFR'S DESCRIPTION: electronic fueling system developed to eliminate pump islands now used in service stations.

USES: service station design and remodeling.

SPECS / FEATURES: system employs electronics where mechanical devices are now in operation. System has three basic elements: in-line electronic flow meter which generates electric current in direct relation to movement of gasoline, control unit and computer-indicator. According to mfr, retractable service hose and nozzle may be installed either below pavement level or in overhead.
AIA file no. 35-M

MFR: BOWSER, INC.
Circle 27 for further information



31 UNITS FOR RECIRCULATING CEILING AIR

HVAC

Cooling tower has enlarged capacity

MFR'S DESCRIPTION: 150 ton, vertical discharge unit now available in cooling tower line.

USES: air conditioning applications.

SPECS/FEATURES: features 20 year guarantee on wetted deck surface against failures due to attack by fungus or rot. Designed with low, compact silhouette; height is under 9'. Made only in 10-gauge design.
AIA file no. 30-F-3

MFR: HALSTEAD & MITCHELL
Circle 28 for further information

Ballast for germicidal lamp operation

MFR'S DESCRIPTION: ballast introduced which delivers rated lamp current and provides maximum germicidal effectiveness.

USES: application in evaporative coolers and room air conditioners.

SPECS/FEATURES: designed specifically for one G25 T8 lamp to operate at 118 v, 60 cycles, at 600 milli-amps. Said to eliminate need for two smaller ballasts.
AIA file no. 30

MFR: GENERAL ELECTRIC CO.
Circle 29 for further information

Vertical flow air-cooled condensers

MFR'S DESCRIPTION: line of vertical flow air-cooled condensers is offered.

USES: commercial and industrial installations.

SPECS/FEATURES: the units range in size from three to 100 tons. Horizontal mounting of fan and coils permits units to have lower silhouette. Main proportions are horizontal, reducing roof loading.
AIA file no. 30-F-3

MFR: HALSTEAD & MITCHELL
Circle 30 for further information

Units for recirculating ceiling air

MFR'S DESCRIPTION: units for recirculating ceiling-accumulated warm air added to circulating fan line.

USES: industrial buildings.

SPECS/FEATURES: circulating units consist of fan, plenum chamber with air guides and revolving or fixed discharge. Recirculation said to reduce load on building heating systems. Installations aid exhaust systems in disposal of smoke, fumes, and odors.
AIA file no. 30-D-1

MFR: L. J. WING MFG. CO.
Circle 31 for further information

Versatile, three-part heat pump

MFR'S DESCRIPTION: *Tri-Pak* is versatile heating and cooling unit for both summer and winter.

USES: residential installations.

SPECS/FEATURES: unit is air cooled; needs no plumbing; is electrically operated. Adaptability arises from three part design. Remote condenser is placed outside house and indoor coil and air handler can fit in roof space only 3' high.
AIA file no. 30-C-15

MFR: PERFECTION INDUSTRIES, DIV. HUPP CORP.
Circle 32 for further information

PLASTIC UNITS

Fireproof panels adapted for school construction

MFR'S DESCRIPTION: *Hetron* resin based, *Fire-Snuf* plastic panels, of Resolite Corp., in interesting application on southern school.

USES: as overhangs and plenum chambers.

SPECS/FEATURES: to comply with fire codes, 9′ fireproof panels were used as overhangs on exterior walkways and as plenum chambers to provide evenly distributed daylight with true color values; used on Tuckahoe Junior High School, Richmond, Va., designed by Godwin W. Draper, architect, formerly of Commonwealth Engineers and Architects of Richmond. School is of one-story, campus type; corridors were eliminated in favor of exterior walkways. Panels said to eliminate maintenance and provide glare-free daylighting.
AIA file no. 26-A-9

MFR: DUREZ DIV., HOOKER CHEMICAL CORP.
Circle 33 for further information

Plastic units for carpet protection

MFR'S DESCRIPTION: *Carpet Guards* developed of *Bakelite* plastic to prevent damage to carpets.

USES: varied floor installations.

SPECS / FEATURES: plastic "feet" support furniture weight on carpet piling. Reported to be impervious to cleaning compounds; guaranteed to stop holes, rust marks and stains.
AIA file no. 28-E

MFR: UNITED STATES CASTOR CUP CORP.
Circle 34 for further information

Plastic coating for roof protection

MFR'S DESCRIPTION: plastic roof coating developed, called *Glacier-Cote.*

USES: residential and commercial structures.

SPECS/FEATURES: material reportedly reduces heat absorption, increases life of composition roofs, cools interior and reduces fire hazard. Intended as protective and reflective coating for asphalt and wood roofs, asbestos-cement and other composition roofs and clay and cement tile.
AIA file no. 24-B

MFR: MATHEWS PAINT CO.
Circle 35 for further information

Plastic draperies for light control

MFR'S DESCRIPTION: *Nassu* monochromatic print design draperies added to *LuXout* light control draperies line.

USES: audio visual rooms in schools, etc.

SPECS/FEATURES: designed to eliminate outside light to permit sharp audio visual projection. Two degrees of intensity available; colors are blue, green, beige and gray.
AIA file no. 28-D-2

MFR: PLASTIC PRODUCTS, INC.
Circle 36 for further information

Colored shingles with plastic finish

MFR'S DESCRIPTION: *Styletex,* color-coordinated sidewall shingle is offered.

USES: exterior siding applications in every climate.

SPECS/FEATURES: available in seven pastel and deeper colors, in addition to white. Finish is polymer plastic, an organic resin component, for hard finish said not to chip or peel. Resistant to sun-fading.
AIA file no. 19-D-2

MFR: THE PHILIP CAREY MFG. CO.
Circle 37 for further information

Plastic pipe in larger diameters

MFR'S DESCRIPTION: polyvinyl chloride plastic pipe now supplied in 8″, 10″ and 12″ diameter sizes.

USES: corrosive locations.

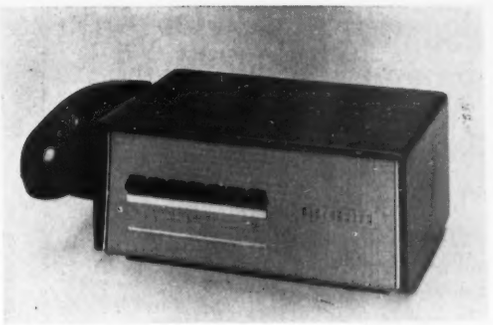
SPECS/FEATURES: two types available: (1) with properties particularly suited for corrosive locations; and (2) containing modifier for high impact resistance. Four thicknesses produced.
AIA file no. 29-B-8

MFR: A. M. BYERS CO.
Circle 38 for further information

COMMUNICATION SYSTEMS

Intercommunication system for offices

MFR'S DESCRIPTION: intercommunication system developed, to replace three separate systems currently in use.



39 INTERCOMMUNICATION SYSTEM FOR OFFICIALS

products, equipment, materials

USES: office applications.

SPECS/FEATURES: features include "magic eye" which indicates who is calling and automatically leaves a message, hidden lamp which announces incoming calls, hands-free operation, advanced acoustical design and faithful voice reproduction.
AIA file no. 31-i-51

MFR: DICTOGRAPH PRODUCTS, INC.
Circle 39 for further information

Public address line expanded

MFR'S DESCRIPTION: three 60-watt public address amplifiers have been added to *M Series*.

USES: public address systems.

SPECS/FEATURES: units feature variable level markers to eliminate dial-twirling. Model MX60 is deluxe unit, 16¼" by 13" by 5⅜". Has four microphone input channels and ten tubes. Other units are similar.
AIA file no. 31-i-7

MFR: BOGEN-PRESTO CO., DIV., THE SIEGLER CORP.
Circle 40 for further information

ELECTRICAL UNITS

Wiring systems with greater capacity

MFR'S DESCRIPTION: two *Headerduct* underfloor wiring systems announced, with greater wiring capacity.

USES: applications utilizing cellular steel floors as raceways for power and communications conductors.

SPECS/FEATURES: *15,000 Series* said to provide 20.294 sq in of dust capacity; *14,000 Series*, 9.2 sq in capacity. Both systems can be combined in one installation by using special connecting device.
AIA file no. 31-C-62

MFR: NATIONAL ELECTRIC DIV., H. K. PORTER CO., INC.
Circle 41 for further information

products, equipment, materials

Quieter integral distribution center

MFR'S DESCRIPTION: integral distribution center with high-temperature insulation is offered; is up to 30 per cent smaller, 15 per cent lighter than previous designs.

USES: industrial plants, hospitals, schools, commercial buildings, etc.

SPECS/FEATURES: standard line is metal clad and is available in ratings from 75 to 225 kva. Standard primary voltage ratings run from 2400 through 4800 v.
AIA file no. 31-B-3

MFR: GENERAL ELECTRIC CO.
Circle 42 for further information

Entrance equipment for electric ac units

MFR'S DESCRIPTION: service entrance devices added to *Uni-Pak* line of equipment.

USES: single phase and three phase electric heat and air conditioning applications.

SPECS / FEATURES: three units: (1) with 200 amp main disconnect and 100 amp branch pullouts for single phase applications; (2) with 100 or 200 amp main lugs, 12 to 20 plug fuse circuits, 1 to 3 30 amp single phase pullouts, 1 or 2 60 amp single phase pullouts and 1 60 amp three phase pullout for air conditioning; and (3) in circuit breaker line with 200 amp fusible main disconnect.
AIA file no. 31-D

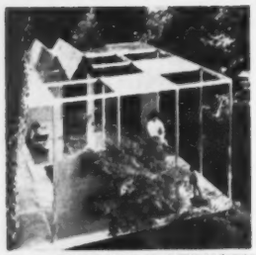
MFR: WALKER ELECTRICAL DIV., I-T-E CIRCUIT BREAKER CO.
Circle 43 for further information

ALUMINUM UNITS

Portable structure of aluminum

MFR'S DESCRIPTION: *View Box*, recent addition to *Forecast* line, is intended to permit

products, equipment, materials

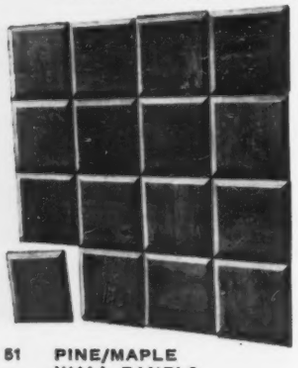


44 PORTABLE STRUCTURE OF ALUMINUM

47 ABRASIVE SURFACE FOR FLOORS

49 PAINT PROCESS FOR GRATING PROTECTION

50 ONE-PART COATING FOR WEATHERING RESISTANCE



51 PINE/MAPLE WALL PANELS

solid-structure comforts of home to be moved into recreational areas.

USES: residential and commercial uses such as guest house, summer house, hunting lodge, field construction office, emergency housing, etc.

SPECS/FEATURES: requires no foundation. Composed of structural aluminum channels and panels of *Alply* plastic and aluminum sandwich construction. Based on 4′ modules to allow changing levels and rooms to be added or removed at will. Rests on adjustable supports, varying up to 6′ in height.
AIA file no. 17-A

MFR: ALUMINUM CO. OF AMERICA
Circle 44 for further information

System of aluminum curtain walls

MFR'S DESCRIPTION: additional series added to *Amarlite* aluminum curtain wall line.

USES: installations ranging from multi-story applications to flush-glazed grid walls for stair wells and show windows.

SPECS/FEATURES: exposed surfaces are anodized. Screws, clips and other fasteners are concealed. System of sealants and gaskets said to accommodate expansion and deflection movements without admitting water.
AIA file no. 17-A

MFR: AMERICAN ART METALS CO.
Circle 45 for further information

ADHESIVES/COATINGS

Compound for roof coating

MFR'S DESCRIPTION: *CS 2720* is epoxy compound, designed to give permanent leak protection, used as roof coating on plywood or concrete surfaces.

USES: protective coating for roofs and exterior masonry walls.

SPECS/FEATURES: said to cure tack-free within six hours at 75° F. Tensile strength is 800 psi; elongation factor is approximately 50 per cent, permitting material to expand or contract with surface materials. Resistant to water, sunlight, ice, snow, spillage of petroleum products and hydrocarbon materials.
AIA file no. 3-B-1

MFR: CHEM SEAL CORP. OF AMERICA
Circle 46 for further information

Abrasive surface for floors

MFR'S DESCRIPTION: formulation, *Seeded Emeri-Epox*, is abrasive, non-slip flooring material.

USES: areas of vehicular and pedestrian traffic.

SPECS/FEATURES: said to bond well to concrete, asphalt, wood, tile, stone, brick and metal surfaces, and offer superior resistance to chemical attack and mechanical abuse. Is flexible, shrink-proof and waterproof.
AIA file no. 25-G

MFR: WALTER MAGUIRE CO., INC.
Circle 47 for further information

Odorless adhesive for wall tiles

MFR'S DESCRIPTION: adhesive formulation is available for applying *Formica* wall tile.

USES: various tile installations.

SPECS/FEATURES: bond strength reported not harmed by water; can be sprayed, brushed or rolled on surface. Odorless and non-flammable properties claimed.

MFR: FORMICA CORP., SUBS. AMERICAN CYANAMID CO.
Circle 48 for further information

Paint process for grating protection

MFR'S DESCRIPTION: *Ponbake* paint process developed, resistant to wear, abrasion, corrosion, chemicals and weathering.

USES: special and standard gratings.

SPECS/FEATURES: grating is first cleaned and phosphatized; then epon base, high polymer synthetic paint is applied with complete coverage to 1 mil minimum thickness; and grating is baked at 350° F. Product has withstood concentrated sulfuric acid and sodium hydroxide tests, according to mfr.
AIA file no. 25-B

MFR: BLAW-KNOX CO.
Circle 49 for further information

One-part coating for weathering resistance

MFR'S DESCRIPTION: one-part, neoprene rubber based coating, *Coro-Gard 1706*, offered for resistance to weathering, abrasion and chemicals.

USES: exterior coating on curtain walls, air conditioning units, electrical parts, etc.

SPECS/FEATURES: high adhesion claimed on unprimed steel, aluminum, copper, galvanized steel, concrete, wood and glass fiber reinforced polyester plastics. Can be applied without primer; does not require accelerator or catalyst for curing.
AIA file no. 24-B

MFR: ADHESIVES AND COATINGS DIV., MINNESOTA MINING AND MFG. CO.
Circle 50 for further information

WOOD UNITS

Pine/maple wall panels

MFR'S DESCRIPTION: square panels developed as wall and ceiling finish material.

USES: commercial and residential walls and ceilings.

SPECS / FEATURES: raised panels have feather edge for ease of application. Are 16″ square, ¾″ thick. Wood is knotty pine, finished in pine or maple or unfinished.
AIA file no. 19-E-6

MFR.: YIELD HOUSE
Circle 51 for further information

Wood door/shutter and screen line

MFR'S DESCRIPTION: woven wood bi-fold doors, interior

shutters and decorative screens added to *Tropix-Weve* line.

USES: interior residential installations.

SPECS / FEATURES: units manufactured of redwood with panels of woven redwood or fibrous glass. Available in sliding or bi-folding styles, in standard and custom sizes.
AIA file no. 19-E

MFR: CLOPAY CORP.
Circle 52 for further information

PLUMBING

Pressure regulating valve line

MFR'S DESCRIPTION: line of pressure regulating valves has been redesigned.

USES: hot water systems.

SPECS/FEATURES: reportedly can be used on initial pressures up to 250 lbs, and can deliver up to 100 lbs. Maintenance ease stressed. Said to protect plumbing fixtures, reduce water hammer and improve dishwashing machine operation by controlling rinse spray pressure.
AIA file no. 30-C-2

MFR: H. A. THRUSH & CO.
Circle 53 for further information

Unit for dispensing hot water

MFR'S DESCRIPTION: *Instant-Hot* unit is available, for dispensing hot water for coffee, tea, soups, etc.

USES: home, office or factory use.

SPECS/FEATURES: said to deliver up to 60 cups of 190°—200° F water per hour. Can be sink mounted or attached to water cooler or wall. Operates on 115 v ac current.
AIA file no. 29-H

MFR: PLUMBING EQUIPMENT DIV., NATIONAL RUBBER MACHINERY CO.
Circle 54 for further information

Swimming pools with reinforced side panels

MFR'S DESCRIPTION: swimming pool line has reinforced side panels of *Surf-Tex*, fibrous glass reinforcing agent.

USES: residential installations.

SPECS/FEATURES: units are custom designed. Reinforced side panels said to eliminate need for painting or caulking. Can be designed in any size or shape; have lifetime guarantee.
AIA file no. 35-F-2

MFR: SURF-SIDE POOLS, INC.
Circle 55 for further information

Electric dispenser for hot and cold water

MFR'S DESCRIPTION: bubbler type electric water dispenser, *HCH-5*, is designed to serve both hot and cold water.

USES: industrial, institutional and similar applications.

SPECS/FEATURES: unit described as capable of delivering 60 six ounce cups of 190° F water per hour; 50° F cool drinking water for 60 persons per hour. Has one cu ft storage/freezer compartment.
AIA file no. 29-D-42

MFR: CORDLEY & HAYES
Circle 56 for further information

HARDWARE

Paumelle hinge for interior doors

MFR'S DESCRIPTION: *BB 93* is paumelle hinge.

USES: interior doors.

SPECS/FEATURES: made of bronze forgings. Available only in 5" x 4½" size.
AIA file no. 27-B

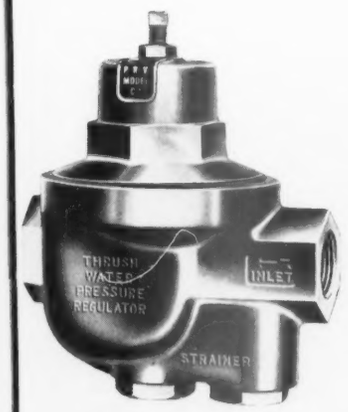
MFR. STANLEY HARDWARE DIV., STANLEY WORKS
Circle 57 for further information

Improvements in roofing nails

MFR'S DESCRIPTION: *No. 14 ES/nail*, self-locking fastener for securing roofing felts to low density roof materials, has been improved.

USES: fastener for roofing materials.

SPECS/FEATURES: strength has been increased for better performance in precast or poured low density roof decks; prepunched roofing cap assures



53 PRESSURE REGULATING VALVE LINE

67 PAUMELLE HINGE FOR INTERIOR DOORS

proper operation and speeds application; nail and cap contained in one compact box.
AIA file no. 27-A

MFR: ES/PRODUCTS, INC.
Circle 58 for further information

Electric locking unit for security and safety

MFR'S DESCRIPTION: electric locking units offered for use where light or air trap is used.

USES: areas where two opposing doors should not be open simultaneously, e.g., X-ray and photographic dark rooms, recording studios, constant temperature rooms, etc.

SPECS/FEATURES: opening of either door automatically locks opposite door. Doors can be opened together in case of power failure, or by using separate switch.
AIA file no. 27-B

MFR: CHALLENGER LOCK CO.
Circle 59 for further information

LIGHTING

Bedlight for hospitals

MFR'S DESCRIPTION: bedlight unit has been developed, geared to needs of patient and hospital staff.

USES: hospital rooms.

SPECS/FEATURES: unit has high and low lighting levels. Swivel-mounted wood shield directs light upwards or downwards as occasion demands.
AIA file no. 31-F-28

MFR: LAM, INC.
Circle 60 for further information

Surface mounted lighting series

MFR'S DESCRIPTION: *43-88 Line*, surface mounted lighting fixture series, is available.

USES: vestibules, lobbies, covered walkways, swimming pools, etc.

SPECS/FEATURES: aluminum construction throughout, with satin anodized finish. Supplied with 4" aluminum junction box, gasket and screws. Listed by UL for use with up to 2-100 watt incandescent lamps.
AIA file no. 31-F-22

MFR: MCPHILBEN LIGHTING, INC.
Circle 61 for further information

Recessed incandescent lens boxes

MFR'S DESCRIPTION: *Uni-Frame* is line of recessed incandescent lens boxes.

USES: residential and public buildings.

SPECS/FEATURES: can be fitted with either lens or glass bowl. Ten inch unit accommodates 100-150 watt lamps; 12" unit, 200-300 watt lamps. Unit reported to need no plaster frame; can be installed in concrete ceilings.
AIA file no. 31-F-21

MFR: DAY-BRITE LIGHTING, INC.
Circle 62 for further information

Decorative outdoor floodlight line

MFR'S DESCRIPTION: weatherproof, decorative outdoor floodlight line is announced.

USES: outdoor lighting installations.

SPECS/FEATURES: three shapes available in range of colors and finishes. Intended for up to 300 watt medium base lamps, with fixtures available for ceilings and walls singly or in clusters. Are UL and CSA approved.
AIA file no. 31-F-22

MFR: STONCO ELECTRIC PRODUCTS CO.
Circle 63 for further information

Floodlight line for difficult locations

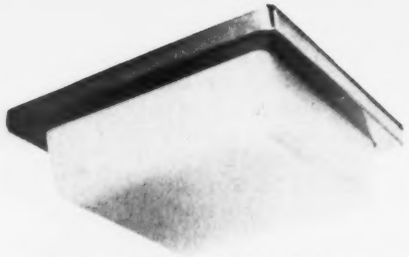
MFR'S DESCRIPTION: *Industrialites* are floodlighting line of vapor-proof units.

USES: locations where smoke, fog, fumes, dirt, moisture and grime are important factors.

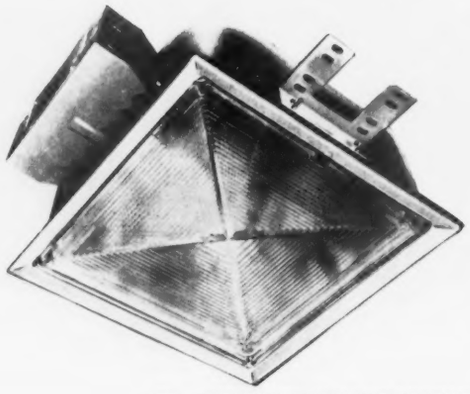
SPECS/FEATURES: cast aluminum socket hood fits under reflector neck to eliminate loosening and admission of foreign matter. Permanent weatherproof seal claimed at point of juncture. Available with etched or specular reflectors, stippled or plain heat and impact resisting covers, for incandescent or mercury vapor lamps.
AIA file no. 31-F-22

MFR: APPLETON ELECTRIC CO.
Circle 64 for further information

60 BEDLIGHT FOR HOSPITALS



61 SURFACE MOUNTED LIGHTING SERIES



62 RECESSED INCANDESCENT LENS BOXES

64 FLOODLIGHT LINE FOR DIFFICULT LOCATIONS

Unbreakable plastic glazing material

MFR'S DESCRIPTION: *Polyglaze* is low cost, unbreakable plastic glazing material.

USES: chemical plants and other industrial buildings.

SPECS/FEATURES: said to be shatterproof, resistant to corrosive effects of chemical and other industrial atmospheres. Can withstand temperature extremes; will not deteriorate or discolor with age.
AIA file no. 26-A-9

MFR: AMERICAN POLYGLAS CORP.
Circle 65 for further information

Lighting fixture with plastic shield

MFR'S DESCRIPTION: *Garlite 101* is lighting fixture with plastic *Dualens* shield.

USES: individual or continuous installations.

SPECS/FEATURES: shield is one-piece extrusion. Sides are diffuse white and bottom is clear crystal to reduce side brightness while maintaining efficient down lighting.
AIA file no. 31-F-23

MFR: GARCY LIGHTING, DIV. GARDEN CITY PLATING & MFG. CO.
Circle 66 for further information

Lighting fixture for steel deck installation

MFR'S DESCRIPTION: lighting fixture offered for flush installation in standard long-span combination steel roof-ceiling deck.

USES: schools, auditoriums, shopping centers and light manufacturing structures.

SPECS/FEATURES: reported to be ideal for installations requiring standard roll-formed steel roof decks in spans up to 30' or more, without inter-

mediate supports. Is of 20-gauge steel, finished in white enamel. Produced in 48", 72" and 96" lengths.
AIA file no. 31-F-21

MFR: BUILDING PRODUCTS DIV., R. C. MAHON CO.
Circle 67 for further information

Medium and high mounting reflectors

MFR'S DESCRIPTION: medium and high mounting reflectors for RLM specifications 4A, 4B and 4C available.

USES: 400 watt mercury and 300-1500 watt incandescent lamps.

SPECS / FEATURES: units have 16" and 18" diameters; are all white porcelain enamel. Available with threaded socket or *Easy-Tach* construction for pendant or box type mounting.
AIA file no. 31-F-24

MFR: QUADRANGLE MFG. CO.
Circle 68 for further information

Recessed lighting fixture line expanded

MFR'S DESCRIPTION: twelve units added to recessed lighting fixture line for 1960.

USES: light commercial and residential use.

SPECS/FEATURES: units are pre-wired; designed for low cost installation with no necessity for framing in, according to mfr. Models have such features as: housing depth of 3"; diffused lenses; prismatic, wide angle lenses; and inner baffle design. Available in varied colors and finishes.
AIA file no. 31-F-23

MFR: PRYNE DIV., EMERSON ELECTRIC MFG. CO.
Circle 69 for further information

OFFICE AIDS

Conveyor for office paper work

MFR'S DESCRIPTION: office conveyor is described as versatile unit, adaptable for any office.

USES: office departmental and interdepartmental paper work movement.

SPECS/FEATURES: moves individual forms and documents at any speed to meet specific re-

quirements. Direction of each belt can be changed, and position of stops adjusted for any point along belt.

AIA file no. 35-H-4

MFR: MERCURY INDUSTRIES, INC.

Circle 70 for further information

Low-cost, compact reproduction machine

MFR'S DESCRIPTION: low-cost, diazotype reproduction machine, *Copyflex Model 42*, is designed to bring advantages of quality black-on-white copying to any office, regardless of size.

USES: engineering office and field uses.

SPECS/FEATURES: makes tracings up to 42" wide by any length. Developer is odorless and free of noxious fumes. Measures 6½" high by 12" deep by 56" long.

AIA file no. 35-H-31

MFR: CHARLES BRUNING CO., INC.

Circle 71 for further information

Collating machine for offices

MFR'S DESCRIPTION: high-speed, electric collating machine for gathering printed or mimeographed sheets is available.

USES: office unit.

SPECS/FEATURES: unit is 20" by 48" by 57" high, weighs 300 lbs. Said to collate eight sheets per second and automatically stack them in crisscross pattern for stapling or binding.

AIA file no. 35-H-4

MFR: HALVERSON PRODUCTS CO., INC.

Circle 72 for further information

MISCELLANY

Boiler water control system

MFR'S DESCRIPTION: side-stream boiler water control system now available in standard models for all types of steam boilers up to 1,000 hp and custom

Circle 14 for further information

units for boilers up to 6,000 hp.

USES: elimination of sludge and suspended solids.

SPECS/FEATURES: reported to save up to 20 per cent on fuel consumption, up to 75 per cent on treatment chemicals, up to 75 per cent on blowdown heat and water losses and up to 100 per cent on contaminated condensate losses. Based on continuously recirculating boiler water through side-stream filter and filter pre-coat that reduces suspended solids to a value close to zero.

AIA file no. 34-B-1

MFR: SPARKLER-FILTRION CORP.
Circle 73 for further information

Portable unit for food transportation

MFR'S DESCRIPTION: *Model IPT60* is stainless steel, portable cabinet designed for food transportation.

USES: institutional applications.

SPECS/FEATURES: unit can transport food on 14" by 18" trays, 18" by 26" trays or in 12" by 20" pans of any depth with lids. Support clips are adjustable.

AIA file no. 35-C-13

MFR: LINCOLN MFG. CO., INC.
Circle 74 for further information

Floor anchor for athletic equipment

MFR'S DESCRIPTION: floor anchor of less than 1" diameter at floor level, has been introduced.

USES: gymnasium equipment installations in wood, tile and concrete floors.

SPECS/FEATURES: mfr states test results show anchor holds loads of 2 tons, mounted in wood floor. Savings of up to 80 per cent in installation time reported.

AIA file no. 35-F

MFR: PORTER ATHLETIC EQUIPMENT CO., DIV. WACO MFG. CO.
Circle 75 for further information

Circle 14 for further information

products, equipment, materials

Security key control system

MFR'S DESCRIPTION: *TelKee* key control systems, equipped with Sargent & Greenleaf combination locks, are announced to provide security for all keys in locking system.

USES: maximum security in military, industrial, commercial and institutional applications.

SPECS/FEATURES: units are dead bolt locks with 8,000 possible combination changes. Encased dial restricts observation of dial numbers to individual dialing combination.
AIA file no. 35-N-23

MFR: P. O. MOORE, INC.
Circle 76 for further information

Surveying instruments with Japanese lenses

MFR'S DESCRIPTION: *Path* surveying instruments, line of surveying transits and levels, now available.

USES: surveying.

SPECS/FEATURES: line includes 4" and 6" transits, transit levels, dumpy levels, eye levels, tilting levels and pocket levels. Japanese lenses used, to provide superior definition, powerful magnification and total accuracy, according to mfr.
AIA file no. 35-N-8

MFR: CHARLES BRUNING CO., INC.
Circle 77 for further information

Aluminum/vinyl weatherstrip

MFR'S DESCRIPTION: weatherstrip developed, to stop sounds, drafts, leaks, light and dust at both interior and exterior openings.

USES: institutional, commercial and residential doors.

SPECS/FEATURES: consists of strip of aluminum alloy with vinyl insert having four soft, continuous ridges which mold to door. Vinyl reportedly does not become soft or sticky. May be pre-painted; has no interlocking pieces, thus facilitating installation.
AIA file no. 35-P-6

MFR: PEMKO MFG. CO.
Circle 78 for further information

Bus duct for distribution systems

MFR'S DESCRIPTION: *XL* duct announced for *XL BUStribution* duct systems; is flexible, easy to install and features plug-in power take-offs any place along line.

USES: electrical distribution in industrial plants and commercial buildings.

SPECS/FEATURES: the mfr claims product incorporates safety features; can withstand unusual electrical and mechanical stresses; has low voltage drop; has simplified joint; and meets present building standards. Designed to use aluminum but copper is available. Installed on Cobo Convention Hall in Detroit.
AIA file no. 31-C-621

MFR: BULLDOG ELECTRIC PRODUCTS DIV., I-T-E CIRCUIT BREAKER CO.
Circle 79 for further information

Architectural panel for noise reduction

MFR'S DESCRIPTION: *E H Noise Reduction Panel* introduced, featuring sound absorption qualities comparable to acoustical tile material; also prevents sound transmission.

USES: separation and reduction of noise in offices, factories, schools, recording studios, etc.

SPECS/FEATURES: unit has light color veneer type finish with lacquer coating said to be scuff resistant. Panel has one perforated and one unperforated side. Size is 4' x 8'; thickness is 2⅜". Can be cut with conventional carpenter tools, according to mfr.
AIA file no. 39-B

MFR: ELOF HANSSON, INC., ACOUSTICAL DIV.
Circle 80 for further information

Institutional disposer for food waste

MFR'S DESCRIPTION: *Jeffrey Garbridder* is food waste disposer unit for efficient operation.

USES: institutional applications such as supermarkets, schools, hospitals, etc.

SPECS/FEATURES: stated to have quiet and simple operation. Reduces bones, shells, paper cartons, etc. to fine slurry for passage into sewage system. Adaptable to undercounter and dishtable installation.
AIA file no. 35-J-4

MFR: UNITED MANAGEMENT CORP.
Circle 81 for further information

Fasteners available in larger diameters

MFR'S DESCRIPTION: *Huckbolt* fasteners in ⅝" and ¾" nominal pin diameters are now available. Line now ranges from 3/16" to ¾".

USES: construction.

SPECS/FEATURES: units produced in aluminum alloy (2024), mild steel (AISI 1038) and stainless steel (300 Series).
AIA file no. 13-C-1

MFR: HUCK MFG. CO.
Circle 82 for further information

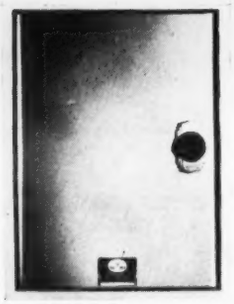
Three models added to marking line

MFR'S DESCRIPTION: *Models No. 133, No. 126* and *No. 127* added to *Magic Marker* line.

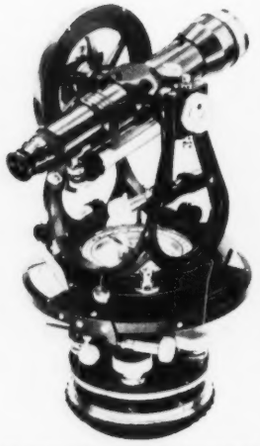
USES: industrial marking uses.

SPECS/FEATURES: said to make indelible marks on porous, non-porous, clean, smooth, dirty, rough, oily surfaces of metal, concrete and lumber. Refills available.
AIA file no. 35-i

MFR: SPEEDRY CHEMICAL PRODUCTS, INC.
Circle 83 for further information

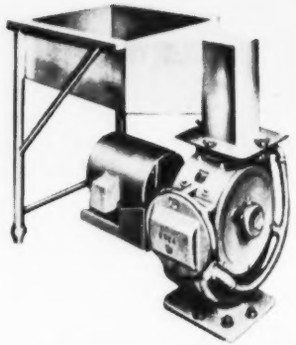


76 SECURITY KEY CONTROL SYSTEM



77 SURVEYING INSTRUMENTS WITH JAPANESE LENSES

78 ALUMINUM/VINYL WEATHERSTRIP



81 INSTITUTIONAL DISPOSER FOR FOOD WASTE

THE ANATOMY OF A NEW PROJECT

preview: 12

Sproul Hall, Los Angeles, Calif. — *project*
University of California at Los Angeles — *client*
Welton Becket, FAIA, and Associates — *architects and engineers*
Murray Erick Associates — *structural engineers*
Haas-Haynie-Frandsen — *general contractor*

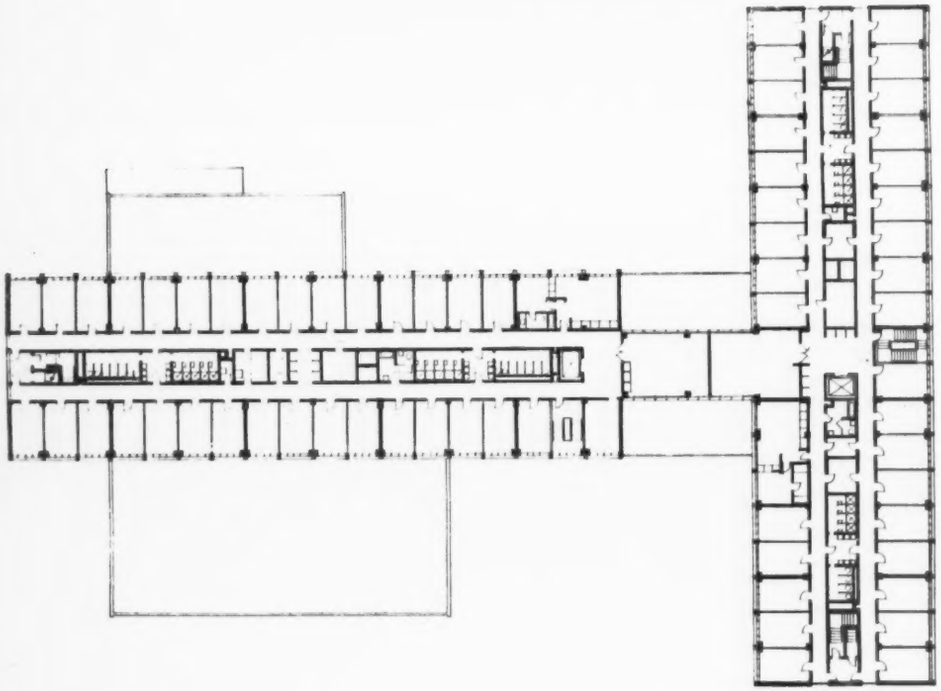
General description of program

Located since 1929 in the western section of the sprawling metropolis of Los Angeles, the rapidly expanding University of California at Los Angeles' total student housing accommodations have, until recently, consisted of one small dormitory for women.

Since UCLA is located in one of the nation's highest income areas, off-campus housing is scarce and expensive. As a result, the school has long been known as a "streetcar campus" with the great majority of its 15,000 students commuting daily from the city.

On-campus residence halls, long sought by students, faculty, and administrators, have recently become a reality. The site chosen is a University-owned sloping hilltop overlooking the campus to the east, the Pacific Ocean to the west, the Santa Monica Mountains to the north, and the fashionable city of Westwood Village to

(Continued on page 32)



Typical floor plan of Sproul Hall.

the south. On this site, the University plans to build eight residence halls to house a total of 6,500 students.

First of the halls, opened last fall, was a rectangular ten-story tower designed for a particular rise on the site and programmed to house 800 men. The second hall, however, described here, was programmed to house 400 men and 400 women and is expected to be a prototype for the remaining dormitories. Presently under construction, completion of Sproul Hall is scheduled for April, 1960.

Plan elements

The project consists of two connecting units, each seven stories high, in a "T" relationship. Each of the two units is a six-story rectangular tower balanced across a one-story base. Exterior treatment of the sides of the towers features horizontal aluminum windows alternating with concrete spandrels and cross-hatched with narrow concrete "eyebrows." Aluminum sunshades at a 45 degree angle to the building, shield the south and west elevations. Ends of the towers are split brick with exposed staircases down the centers, enclosed by cast concrete grills. The span connecting the towers features porcelain enamel and glass curtain walls with concrete spandrels.

General features

Each tower houses just over 400 men or women with one graduate student on each floor. There are two head resident apartments. Each floor has 34 or 35 two-student rooms, depending on the tower, two sets of washrooms in a central core, a laundry room, a study room and an elevator lobby. A typical room is 11 feet by 16 feet and is furnished with built-in wardrobes and chest of drawers, desks and bookshelves and convertible sofabeds.

The first-floor tower base contains a 5,400 square foot common dining room for 500 men and women students served by a large kitchen, a lounge and a recreation room for women, and similar facilities for men. The recreation rooms are separated by a movable wooden partition for opening into one huge room for dances.

Base of the entire building is a huge outdoor terrace with mammoth planters. Terrace walls are smooth stones cast in concrete. A partial basement beneath the terrace houses mechanical equipment and storage and utility rooms.

Structural notes

The structure is a flat plate, reinforced concrete system with spread footings. Seismic conditions and the sloping site dictated especially heavy use of reinforcing rods. The two towers are actually two structures, separated by a seismic joint. The ends of the towers, supported by free-standing concrete columns, extend as much as 33 feet beyond the main floor bases and form covers for the outdoor terrace below.

Mechanical and electrical notes

Each tower floor is independently heated with its own gas-fired forced air system. Warm air is exhausted into the rooms and is collected through air intakes in the hallways. First floor facilities are cooled by evaporative cooling equipment located in the basement. Each student room has a center ceiling light, two double reflector study lamps, and a light over each wardrobe mirror.

Area and costs

Total area of Sproul Hall is 188,540 square feet. This is divided into 31,300 square feet on the first floor, 71,570 square feet in one tower and 73,170 square feet in the other and 12,700 square feet in the basement. Cost of the structure will be approximately $3,671,000.

literature

Literature cited in this department is available from various manufacturers and associations free of charge. To obtain copies, circle the keyed numbers on the reader service cards facing pages 1 and 42.

Slag in construction

Current booklet describes role of blast furnace slag in plant construction. Applications of slag for drainage, roads, parking lots and railroad ballast within plants are detailed. Also mentioncd is use of slag in concrete building blocks. (18 pp.)
AIA file no. 36

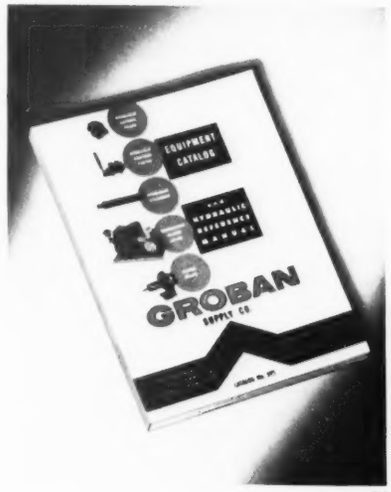
MFR: SLAG PRODUCTS SECTION, U. S. STEEL CORP.
Circle 84

84

Alkyd resin system

Alkyd resin system utilizing trichlorofluoromethane as foaming agent, developed for preparation of rigid fire-resistant polyurethane foams with low K factor, is described in *Preliminary Technical Bulletin No. 14*. Foams said to be of particular use for cores in sandwich type construction, pipe covering and other insulation applications. Bulletin indicates system permits processing in continuous mixing and metering machines or in batch mixing equipment, and outlines procedure followed in each method. (5 pp.)
AIA file no. 37

MFR: HOOKER CHEMICAL CORP.
Circle 85



86

Equipment catalog

Industrial equipment is illustrated in current catalog. Equipment treatment is comprehensive; used for original manufacture or maintenance in many industries. Hydraulic equipment, construction, diesel and automotive units are included. Specifications, drawings and suggested uses are contained. (60 pp.)
AIA file no. 35

MFR: GROBAN SUPPLY CO.
Circle 86


87

Fibrous glass curtains

Topical bulletin describes *Fenestration Fabrics*, decorative curtains of *Fiberglas*, used for properties of glare, light and heat control, as well as decorative purposes. Bulletin presents charts affording information on noise reduction coefficients, light transmittance values and specifications. Included are colored photographs of installations. (8 pp.)
AIA file no. 28-D-1

MFR: OWENS-CORNING FIBERGLAS CORP.
Circle 87

Facebrick folder

Revised facebrick folder has been prepared, containing color reproductions of colors and textures of varied line of facebrick. Folder contains short specifications, other architectural data and estimating reference chart. (6 pp.)
AIA file no. 3-F-1

MFR: PACIFIC NORTHWEST DIV., GLADDING, MCBEAN & CO.
Circle 88

Concrete testing bulletin

Illustrated booklet contains complete specifications for portable, 250,000 lb concrete testing machine. Booklet also contains information on accessory equipment for use with the tester. (4 pp.)
AIA file no. 4-A-1

MFR: SOILTEST, INC.
Circle 89

Auditorium acoustics

How the Illusion of an Acoustically Perfect Auditorium is Created is brochure which describes and illustrates design and features of "acousto-electronic" sound system installed at RCA's David Sarnoff Research Center Auditorium. Progressive delay system is employed to create illusion of sound coming from the stage, regardless of seating location or proximity to loudspeakers. Microphones are recessed in stage ceiling and loudspeakers are concealed. (12 pp.)
AIA file no. 31-i-7

MFR: RADIO CORP. OF AMERICA
Circle 90

Service fixture catalog

Lab-Flo line of laboratory service fixtures is presented in current catalog. Line includes stainless steel fittings for high corrosion resistance applications in fume hoods, and selection of deck mount and combination electrical receptacles, with gas outlets, in single or double face and gang arrangements. (4 pp.)
AIA file no. 35-E

MFR: T&S BRASS AND BRONZE WORKS, INC.
Circle 91

WOOD UNITS

Hardwood flooring manual

Specification manual for Northern hard maple, beech and birch flooring is now available. Included are rules for grading hardwood flooring, information on physical characteristics of species used in flooring manufacture, thicknesses and face widths available, uses of different grades and rules governing reinspection of flooring.
AIA file no. 19-E-9

ASSN: MAPLE FLOORING MFRS. ASSN.
Circle 92

Trussed rafter bulletin

Bulletin no. 40, *Nailed Trussed Rafters With Hardboard Gusset Plates*, by Research Professor, E. George Stern, is available, denoting results of tests performed on nailed trussed rafters assembled with ¼" tempered hard-

literature

board gusset and splice plates. Basic data, procedure and test results are presented with diagrams, photographs and design recommendations. (16 pp.)
AIA file no. 19-B-3

ASSN: WOOD RESEARCH LABORATORY, VIRGINIA POLYTECHNIC INSTITUTE
Circle 93

Interior units

Brochure on hotel, motel and restaurant interiors pictures lobbies, corridors, dining areas and bedrooms, finished in wood paneling. Included is information on use of hardwood paneling and flexible wall coverings, plus guide to *Weldwood* building products. (8 pp.)
AIA file no. 19-E-6

MFR: UNITED STATES PLYWOOD CORP.
Circle 94

Wood core data

Information sheet on *Flakecore* describes wood particle board core for veneered or laminated products. Production background, applications, advantages, sizes and thicknesses provided. (single sheet)
AIA file no. 19-E

MFR: GRAY PRODUCTS CO., INC.
Circle 95

Hardwood flooring

Booklet for 1960 describes manufacturing process of *Ironbound* continuous strip hardwood floors. System consists of flooring strips interlocked with steel splines and embedded in mastic. Various types and specifications are presented. Suitable for use in gymnasiums, classrooms, industrial buildings, laboratories and others. (8 pp.)
AIA file no. 19-E-9

MFR: ROBBINS FLOORING CO.
Circle 96

WALL/ROOF SECTIONS

Roof deck booklet

Steel deck for roofs, sidewalls, partitions, ceilings and floors is illustrated and described in recent literature. Included are specifications, section property tables, load tables and detail drawings of four types of decks. (16 pp.)
AIA file no. 12-C

MFR: R. C. MAHON CO.
Circle 97

Precast concrete panels

Current folder provides specifications, detail drawings and allied data on precast concrete curtain wall panels, surfaced with ceramic tile. Units said to eliminate need for mullions, grid systems and masonry back-up, as well as to permit minimum of joints. (4 pp.)
AIA file no. 17-A

MFR: MARIETTA CONCRETE DIV., AMERICAN-MARIETTA CO.
Circle 98

Laminated wall panels

Recent bulletin presents technical and manufacturing data on *Arvinyl* laminated panels for walls. Vinyl-metal panels are available in various colors, textures and patterns. Detail drawings and photographs of applications are included. (8 pp.)
AIA file no. 23-L

MFR: ARCHITECTURAL PRODUCTS DIV., ARVIN INDUSTRIES, INC.
Circle 99

Architectural metals

Catalog for 1960 presents features of architectural metal products, including aluminum entrances, store fronts, wall sections and flush glazing construction. Correlation of components, for unified appearance, is indicated. (16 pp.)
AIA file nos. 16-E; 17-A; 26-D

MFR: BRASCO MFG. CO.
Circle 100

ELECTRICAL APPLICATIONS

Electric generating plants

General catalog for 1960 lists line of high-capacity electric generating plants. Catalog describes more than 45 basic models of gasoline and diesel engine driven generator sets. Chart of representative models outlines plant capacity, model number, voltage, starting method, dimensions and weight. (8 pp.)
AIA file no. 31-A

MFR: D. W. ONAN & SONS, INC.
Circle 101

Aluminum strip conductor

Availability of specification and descriptive data sheets for aluminum electrical strip conductor has been announced. Included are general explanation of product, both bare and anodized, techniques of production, chemical composition limits, electrical and anodic film properties and shipping tolerances and procedures. (14 pp.)
AIA file no. 31

MFR: REYNOLDS METALS CO.
Circle 102

Multi-outlet system

Engineering data for multi-outlet system is presented in illustrated folder now available. Folder contains information on wire capacity, methods of fastening to various surface types, devices and fittings and installation instructions. (6 pp.)
AIA file no. 31-C-62

MFR: THE WIREMOLD CO.
Circle 103

Surface raceway data

Recent data sheets, dealing with use of surface raceways in different office applications, have been released. *Sheet A-12* deals with units as ceiling duct for telephone installations in a reinforced concrete multi-storied office building. *Sheet A-13* treats combination multi-outlet and raceway system as solution to problem of wiring for various types of accounting equipment.
AIA file no. 31-C-62

MFR: THE WIREMOLD CO.
Circle 104

COATINGS/FINISHES

Aluminum uses

Aluminum in Architecture contains specifications and information on finishes, alloys and pipe railings. Aluminum units are pictured and additional literature is listed. (8 pp.)
AIA file no. 15-J

MFR: ALUMINUM CO. OF AMERICA
Circle 105

Finishing systems

Line of available finishing systems is illustrated in recent folder. Included are spray guns, automatic spray coaters, flow and dip coaters, industrial ovens, air compressors, dust collectors, spray booths, industrial power washers, hot spray systems, paint tanks and pumps, hoses and connections and phosphatizing systems. (4 pp.)
AIA file no. 25

MFR: THE DEVILBISS CO.
Circle 106

Coating catalog

Catalog has been released, containing information on *DEL* synthetic rubber compound, a *Thiokol* base caulking, sealing and glazing material, and entire line of acrylic, epoxy, vinyl, alkyd and other plastic base coatings. Information also presented on: (1) nonstaining sealing compound for use on white and other light faced marble, stone and masonry joints; (2) alkyd base, aluminum pigmented coating for roofs and sidings; and (3) several recent colors in vinyl, epoxy and synthetic rubber coatings. (16 pp.)
AIA file no. 24

MFR: DAVID E. LONG CORP.
Circle 107

LIGHTING

Interior fixtures

Net Lights, interior lighting fixtures designed by George Nelson, AIA, are described in recent catalog insert sheet. Units range in size from 17" to 38" in height and from $20 to $50 retail in price. (2 pp.)
AIA file no. 31-F-23

MFR: HOWARD MILLER CLOCK CO.
Circle 108

Area floodlighting booklet

Floodlighting booklet provides guides for selecting incandescent or mercury floodlights, general purpose or heavy duty types, for determining need for floodlights based on size of area to be lighted, for such areas as parking lots, construction sites and shopping centers. Footcandle charts and installation diagrams are included. (16 pp.)
AIA file no. 31-F-22

MFR: CROUSE-HINDS CO.
Circle 109

HVAC

Air circulating units

Air circulating units for redistributing warm air from ceilings to floor areas are described in available bulletin. Unit features and engineering data are covered. Tabular information includes dimensions, capacities and area coverage for various mounting heights. (4 pp.)
AIA file no. 30-D

MFR: L. J. WING MFG. CO.
Circle 110

Unit heater catalog

Bulletin no. 1301-B contains details of unit heater line for both steam and hot water. Steam and hot water capacity data, conversion factors, basic formulae, typical quietness levels and piping arrangements are given as reference material. (12 pp.)
AIA file no. 30-C-43

MFR: DUNHAM-BUSH, INC.
Circle 111

Furnace/heater catalog

Recent catalog describes line of gas-fired heaters, furnaces and packaged blowers. Featured is table of contents, enabling reader to select heaters and furnaces according to type, applications, capacities and major features. Sections describe fan-type and

blower-type unit heaters, five-way air flow heaters, heavy duty units, duct and forced air furnaces, blower packages and a motorized vent exhauster. Specifications, dimensions and performance data are included for each category. (28 pp.)
AIA file no. 30-B
MFR: REZNOR MFG. CO.
Circle 112

Steam boiler brochure

Water-tube steam boilers, *Series 20, 22, 23* for steam requirements up to 200 hp capacity, and *Series 40, 50, 60, 70, 80,* for over 7,000 lb/hr, are covered in illustrated brochure. Also contained are efficiency curves, capacity tables and construction features. (8 pp.)
AIA file no. 30-C
MFR: NEBRASKA BOILER CO., INC.
Circle 113

DOORS/HARDWARE

Garage door variations

Wall poster, measuring 34″ x 22″, is offered. Poster cites basic door designs; suggests various panel variations, glass options and special accessories.
AIA file no. 16-D
MFR: CRAWFORD DOOR CO.
Circle 114

Locks/hardware

Entitled *Select-A-Spec,* recent booklet is file folder of line of locks and hardware for commercial, institutional and industrial construction. Six sections present basic data, specifications, dimensions and illustrations of mortise locks, unit locks, cylindrical locks, door closers, exit fixtures and door holders and hinges. (12 pp.)
AIA file no. 27-B
MFR: P. & F. CORBIN DIV., THE AMERICAN HARDWARE CORP.
Circle 115

Garage door control

Weather-King electronic door control for garage doors and lights is subject of current folder. Features described include instant reversing motor, light control, adjustable safety clutch and low-voltage wiring. Other convenience and safety features are illustrated. (4 pp.)
AIA file no. 16-D
MFR: OVERDOOR DIV., BARBER-COLMAN CO.
Circle 116

MISCELLANY

Masonry construction system

Topical folder describes how all-masonry construction system was used

Circle 15 for further information

literature

to provide fire safety, fast erection and economy in two Air Force Academy buildings in Colorado Springs, Colorado. Buildings have transverse masonry bearing walls, located on 21′ and 14′ centers, which support second story precast concrete floor and roof slabs. (6 pp.)
AIA file no. 4-K

MFR: THE FLEXICORE CO., INC.
Circle 117

Kettle fillers

Current catalog describes *Kettle Kaddy* line of kettle and pot fillers and spray stanchions. Units are designed for cleaning unwieldy, steam jacketed kettles in institutional kitchens. Combination kettle filler and spray stanchions are available in 4 models with automatic gooseneck type pot filler and spray valve. (4 pp.)
AIA file no. 35-C

MFR: T&S BRASS AND BRONZE WORKS, INC.
Circle 118

Hospital unit

Recent bulletin provides description of *RBLG Hot & Cold Foodveyor*, hospital food conveyor for delivering filled beverage glasses to patient floors. Seventeen features are illustrated. Bulletin also contains specifications. (single sheet)
AIA file no. 35-C-13

MFR: S. BLICKMAN, INC.
Circle 119

Grid system folder

Grid system of reinforced concrete construction is described in available folder. System, utilizing steel grid domes in 2′ modules, said to speed building time and save material and labor costs over comparable strength flat slab construction. Folder presents concise, illustrated descriptions of grid system, steel grid domes, formwork and utility layouts, safe load tables and layouts of ceilings and floors utilizing this system. (4 pp.)
AIA file no. 4-E-6

MFR: GRID FLAT SLAB CORP.
Circle 120

Multi-arc welding

Indexed booklet treats technology, economics and other practical aspects of multi-arc welding. Publication compares initial operating and maintenance costs of multi-arc and single-operator welding under varying conditions. Also outlines coated electrode welding, applications of multi-arc systems to tungsten arc welding, consumable electrode welding, stud welding and arc air gouging. (71 pp.)
AIA file no. 13-C-2

MFR: J. B. NOTTINGHAM & CO., INC.
Circle 121

Fitting catalog

Copper tube fitting catalog is now available. Data on types of solders and working pressures, dimensions of copper water tube and flow capacities and friction loss allowances for both tube and fittings are provided. (42 pp.)
AIA file no. 29-B-4

MFR: CHASE BRASS & COPPER CO.
Circle 122

Snow removal

Recent brochure presents features of *Thermal* snow melting system. Detail drawings and charts provide dimensional and other technical information. (4 pp.)
AIA file no. 30-A-2

MFR: THERMAL RESEARCH & ENGINEERING CORP.
Circle 123

Drafting aid

Current bulletin describes sprays and cleaning aids to assist draftsmen clean and protect drawings. Prices and illustrations are included. (6 pp.)
AIA file no. 35-H-3

MFR: KEUFFEL & ESSER CO.
Circle 124

Electronic fueling system

Modular Electronic Fueling System for Service Stations, is booklet describing system which purportedly can eliminate conventional service station "island" pedestal pumps as presently used. Electronic components replace mechanical parts to utilize less space and separate meter and computer elements. (16 pp.)
AIA file no. 35-M

MFR: BOWSER, INC.
Circle 125

Extinguishers/cabinets

Current catalog presents line of fire extinguishers and extinguisher cabinets for various types of buildings. Photographs and specifications provided for steel, stainless steel, aluminum and bronze units. Dimensions and types provided in tabular form. (8 pp.)
AIA file no. 29-E-2

MFR: ELKHART BRASS MFG. CO., INC.
Circle 126

FORECAST

(Continued from page 5)

Generic problem

"The second, or *generic*, problem is concerned with family trees of concepts.... Because each concept implies broader concepts, a literature search for information referring to broad concepts of knowledge should effectively retrieve information referring to narrower but related or subordinate concepts. (When one saws off a big branch of a tree, one normally expects all the little branches which are attached to the one big branch to be removed as well—and all in one sawing operation). For example, retrieval of all information pertaining to the chemical family 'halides' should also, and automatically, result in obtaining all information on the members of that family; namely, 'bromdies,' 'chlorides,' 'fluorides,' and 'iodides.'

"It is normal for a concept to belong to more than to one generic tree; 'dichlorodifluoromethane' is a narrower concept within several broad concepts, such as 'chlorinated hydrocarbons' and 'fluorinated hydrocarbons.' In turn, 'chlorinated hydrocarbons' and 'fluorinated hydrocarbons' are both properly 'halogenated hydrocarbons' and 'dichloridfluoromethane' is a 'Freon.'®

"When combinations of concepts must be considered, the family tree relationships are complicated considerably, resulting in intertwined, entangled branches which are by their very nature extremely difficult to separate from each other.

Semantic problem

"The third, or *semantic*, problem involves the relationships between concepts themselves and the *symbols* for concepts (that is, the words or terms used). Simply, the semantic problem is concerned with the relationships between words and their meanings. In this area, we become concerned with synonyms, near-synonyms, and homographs. . . . Examples of semantically confusing words are 'base,' 'color,' 'lead,' 'finish,' 'tank,' and 'cracking.' Homonyms present no particular problem because the terms in most indexes are arranged by spelling and not by sound. Homographs, however must be distinguished from each other because they are spelled the same, but sometimes have different pronunciations and always have different meanings—e.g., 'flashing' (weather protection) and 'flashing' (intermittent light).

"Another significant semantic problem is that there are situations in which two or more words have identical or very similar meanings (depending upon—viewpoint!). For example, within the du Pont Co., the operation of 'moving liquids through pipes' is generally referred to as 'transferring.' In some cases, however, it is referred to as 'transporting.' If pairs of words like 'transferring' and 'transporting' are permitted to remain in the vocabulary of any storage and retrieval system without provision for advising searchers that the information desired may be found under more than one term, than the searcher will retrieve only that pertinent information which is included under the term he *happens* to use in his search; he will not retrieve that information which is listed under the synonymous or near-synonymous term. Any retrieval system must detect the situations in which more than one word or phrase may be used to describe a specific concept and make provision for cross-reference so that a searcher will be able to retrieve essentially all pertinent information on the concepts in which he is interested.

Syntactics

"The last problem is one of *syntactics*. Syntax relates to the ordering or arrangements of words and the changes in meaning of a group of words which may result from modifying the relative order of words within the group. Consider 'one-eyed, one-horned, flying purple people eater.' This problem is particularly important in information systems which employ conceptually short terms—i.e., wherein retrieval is accomplished by using terms which usually stand for single ideas or concepts. For example, coordinating the terms 'fabrication' and 'clamps' retrieves items which refer both to fabrication *using* clamps and to fabrication *of* clamps. Similarly, 'steam' and 'heating' retrieve information on the heating of steam and on heating using steam. Even *this . . . might* sometimes be confusing.... There are also several other specific types of syntactical problems.

"These, then, are our technical or intellectual problems which must be solved adequately in order that we may have effective and economical storage and retrieval of information. You will note that inadequate solution of the first three problems (viewpoint, generics and semantics(results *generally* in the loss of information during retrieval, whereas inadequate solution of the syntactical problem results in obtaining nonpertinent information during retrieval. . . .

Basic approaches

"Under these circumstances, it seems that there are only two *basic* approaches for solving the four technical problems. . . . The first of these is, in effect, the *prescription of a vocabulary* for storage and retrieval. The second is the use of *redundancy* in storage and retrieval. Note, however, that these two basic approaches themselves constitute the extreme ends of another continuum. In practice, no system employs a precise, non-redundant vocabulary nor does any employ a completely 'non-prescribed' vocabulary.

"Examples of prescribed vocabularies

are formal hierarchical classifications, such as the Dewey Decimal system, the Library of Congress Classification, The Universal Decimal Classification, and many small and local classifications. The authority lists used by many librarians are also examples of prescribed vocabularies. . . .

"Accordingly, we would expect to use a prescribed vocabulary for *data* retrieval systems, but *not* for information (or idea) retrieval systems. And, because the *Building Research Institute* is concerned with research information, which ordinarily must carry prose along with any numbers (i.e., data) in order to make the numbers meaningful, the *Building Research Institute* must also be concerned with a somewhat abstract portion of the communicative continuum. Accordingly, we would *not* expect prescribed vocabularies to be generally applicable to *Building Research* information systems.

"It is apparent that prescribed vocabularies, such as formal hierarchical classifications or authority lists, will be advantageous if one or more of the three following situations prevail, as they always do in well-designed *data* retrieval systems:

1. The collection of documents is small, so that they do not need to be subcategorized too greatly.
2. The field of technology covered by the stored documents is narrow, so that the prescribed vocabulary can be small.
3. The number of potential users of the stored information is small, so that the conventions necessary in using the prescribed vocabulary may be policed effectively. . . .

"It has been the experience of most of us that the searcher should . . . have available a set of some sort of abstracts. He can look up the abstracts of those documents to which he is referred and decide quickly which ones are most important to him, which ones to obtain and to read first, which ones to defer action, and (perhaps) which ones to ignore altogether. . . . Under these circumstances, some sort of abstract service is essential.

"On the other hand, abstracts *without an index* serve only a limited purpose—that of advising the reader of *current events*, which may or may not be of interest to him *at the moment* and which he may not remember at some future time when they *should* be of interest. Further, the scanning of large numbers of abstracts is laborious and time-consuming; an index to the abstracts permits much higher search efficiency.

"To summarize, it may be said that the details—the mechanics—of an information storage and retrieval system are not too important at the stage of the game at which the *Building Research Institute* finds itself. Rather, basic considerations—the building of a firm foundation—should be paramount. . . ."

digest:12

SURFACE HARDENING CONCRETE FLOORS

A/E NEWS presents a digest of a paper on "How to Surface Harden Concrete Floors for Longer Wear," prepared by Walter R. Maquire, President, Walter Maquire Co., Inc., New York City.

Dollar savings and more efficient operation are often realized by toughening the surface of concrete floors subjected to heavy traffic. Floors that stand up longer cost less to maintain and reduce downtime. In emery, nature has provided an extremely hard, abrasive material to serve this purpose. Object is to apply particles of emery in such a way as to anchor them in a compact, dense mass right at the surface of the concrete.

Materials

1. Fresh base slab—should be of good quality, with low water-cement ratio. Consistency should be such that slump will not exceed 4 inches.
2. Emery aggregate—should be properly crushed and graded to provide a balanced assortment of particles ranging from ⅜ inch down to fines. This assortment has been found to produce maximum interlocking for compactness and firmest anchorage in the base slab.
3. Cement—should be first quality Portland, Type I, or high-early-strength.

Proportioning of surface hardener

4 parts aggregate to 1 part cement, dry mixed.

Mixing

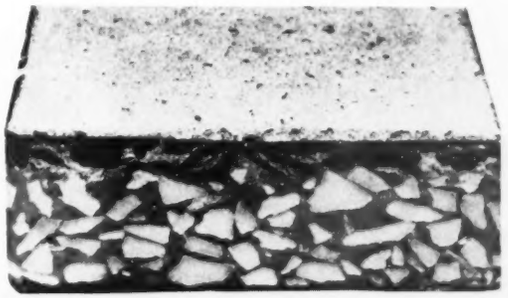
1. Aggregate and cement may be either machine or hand mixed.
2. It is important to make sure that materials and equipment used for mixing are scrupulously dry and clean.

Rate of application

1. The usual application calls for 100 pounds of emery aggregate per 100 square feet of floor surface, for average penetration of ¼ inch.
2. To obtain an extra hard surface, application should be at the rate of 200 pounds of emery aggregate per 100 square feet of floor space. This more dense application requires special techniques, hereafter described. Depth of hard surface in critical areas averages ⅜ inch.

Application (moderately hard)

Screed base concrete to finish grade. If a vibratory or roller screed is used, floating may be omitted at this stage. Any areas that are below should be filled with the dry aggregate-cement mixture, never with neat cement.



Cross section through surface-hardened floor. Dark emery particles mass at surface and interlock to form virtually continuous surface.

Casting emery mixture onto fresh base slab with overhand motion.

Spread the dry mixture over the entire area immediately, while the base slab is still wet. For best results, use a clean, round-pointed shovel. Make sure that the mixture is well loosened, breaking up any lumpy areas with the shovel. Load the shovel only moderately and cast the mixture alternately to left and to right, making an even, crisscross pattern on the floor.

Experience has shown that the easiest and most effective technique is for the shoveler to stand directly between the floor and the wheelbarrow,

(Continued on page 38)

digest: 12

Hand floating emery-aggregate-cement mixture into slab.

Hand troweling and Kelly floating to produce finer finish.

or other source of material. He casts each shovelful with a turning motion, over-hand, so that the face of the shovel is down as the material is cast.

Next, and immediately, the floor is lightly darbied or bull floated. It is important to embed the aggregate flush with the surface but to avoid burying it completely.

Allow the concrete to set-up sufficiently, then finish with a float or troweling machine or by hand-troweling. Care should be taken to avoid over-troweling. Do not trowel to the point where a film of laitence or mortar covers the aggregate.

Final hand troweling may or may not be advisable, depending on the type of service for which the floor is designed. Careful hand troweling will produce a smoother floor. But the abrasive, non-slip properties of emery will provide better traction if the floor is not so treated.

There is an alternative method of application. As soon as the screeded base slab has set-up sufficiently to support the weight of a board with a man kneeling on it an all free water has disappeared from the surface, the men move out across the floor on boards, distributing the dry mixture evenly on the base slab. As before, the floor is immediately afterwards lightly darbied or bull floated.

Method of finishing is as before. The same precautions should be taken with this method to insure that a compact, dense mass of aggregate is anchored firmly at the surface and that no film of laitence or mortar is permitted to form over the aggregate.

Application (extra hard)

Straight-edge or roll base concrete to screed level. Then darby or bull float it.

Immediately broadcast the dry mixture onto the base slab, by either of the two methods previously described, but use only 50 pounds of aggregate per 100 square feet of floor space. Darby or bull float the surface again. Immediately apply another 50 pounds of aggregate per 100 square feet of floor space and, again, darby or bull float the surface. Then apply the third broadcast, again at the rate of 50 pounds per square feet. But, this time, do not darby or bull float. Let the floor remain as it is until it will bear the weight of a man.

Now machine the floor with a power-driven disc float, or a troweling machine 48 inches in diameter and equipped with flat shoes. Then, immediately broadcast another and final load of dry mixture, again at the rate of 50 pounds per 100 square feet. Machine the surface as before. Finish as described for application of a moderately hard surface.

Curing

1. Liquid chemical (sodium silicate based) cure may be applied either by spraying with a garden spray or by mopping. Application should be made as soon as possible without marring the surface. This cure seals the floor to prevent moisture from evaporating.
2. Water cure is effected by keeping the floor wet continuously for 14 days. This may be done by spraying or flooding or by covering the floor with wet burlap or wet sand. Water used for this purpose must be cold, fresh, and perfectly clean. Burlap or sand must be clean.
3. Membrane cure is effected by covering the floor with a non-staining, waterproof membrane for 14 days. Membrane must be strong enough to stand up under ordinary abrasive action and wear and should weigh at 7½ ounces per square yard. All joints must be air-tight.

abstracts

Shift to the metric system

From a talk by Lewis L. Strauss, former Secretary of Commerce, before the American Physical Society, Washington, D. C., May 1, 1959.

"I have long been convinced that ultimately the United States must shift to the metric system. Outside of our Anglo-Saxon culture, practically every nation has made this shift during the past 150 years or so. Every country found it possible to adopt the metric system—just as in earlier times we all shifted from the Ptolemaic to the Copernican system of navigation. No one ever regretted the temporary inconvenience of such switches. Due to our delay in taking action and due to the complexity of our industrial system, this change will be more difficult for the United States than for other countries, but when achieved it will also be more useful.

"There is absolutely no doubt, the conditions of our times—the increasing importance of science for all phases of life as well as the increasing interdependence of nations through security, travel, communications, exchange, aid and trade—all require a convergence on one system of measurement.

"The force of science and technology as well as the needs of the international economy will require the change. Science exerts an ever stronger impact on our society—and the language of science is couched in metrical terms. The more computer techniques come into significant use—and before this audience I need not predict the future role of such computational techniques—the greater will become our need for an efficient system of measurement. . . .

"Actually, we are in error if we assume that we are using only the English system of measurement in the United States. At the present time, we are using both systems. There is little left of the English system in science. But the metric system also has been invading our daily lives. Slide rules and desk calculators are metric in nature. The decimal point with which we adorned the English system is an eloquent witness to the indispensability of the inevitable metric

measurement. We switched from pounds and shillings to dollars and cents. . . .

"The problem, therefore, is not to make a revolution in measurement but to direct and accelerate the evolution which has been taking place. It is a matter of becoming conscious of this evolution and of giving an assist. It is a matter of using the metric system more and more and the English system less and less. . . .

"Recently a committee to consider the problems of shifting to the metric system was established by the American Assn. for the Advancement of Science after it had approved in principle the general adoption of the metric system of weights and measurements. . . .

"The metric system lends itself most easily to providing an interrelated network covering all scientific fields. The fact that science is on the metric system and that civil engineering and industry by and large are on the English system makes for a great deal of unnecessary confusion and difficulty. This double system is costing us money, time and trade. I would not be surprised to learn that it is also hampering progress in other directions. . . .

"The work of the existing AAAS Committee on Metric Usage will receive the important consideration which it deserves, as well as that of the parallel committee of the British Assn. for the Advancement of Science. We will examine the experience of India and Japan in the fairly recent shift to the metric system in those countries. This should pinpoint for us some of the problems involved in such a change-over. Japan's experience would be especially pertinent since that country faces a number of advanced technological problems similar to those faced by us.

"If there should be a parallel committee in other countries using the English system, we would want to make our studies cooperative in order to insure continued effective cooperation and the avoidance of duplication.

"In the meantime, the National Bureau of Standards will continue its extensive program of providing calibration services in both the English and the metric systems. The calibration system of the Bureau will be expanded and services in both systems will be available as long as any important segment of our society requires calibration in either system. . . ."

Again this month, NAMES profiles one of the architectural profession's younger men. We believe that our readers are interested in knowing more about architects and consulting engineers who have achieved some measure of distinction in their careers and by their efforts will contribute to the ranks of tomorrow's leadership in their respective professions. The editorial department welcomes suggestions and recommendations concerning practitioners, whom in the view of the reader, should be accorded consideration in this department.

JOHN HARO, AIA

Earlier this year, the Graduate School of Architecture and Design at Harvard University announced that John Haro, AIA, Designer and Associate of Albert Kahn Associated Architects and Engineers, Inc., had been chosen to receive its internationally recognized *Arthur W. Wheelwright Fellowship* for 1959-1960.

The Wheelwright Fellowship, one of architecture's most coveted awards, was established in 1935 from a gift of $100,000 made as a permanent foundation for a Fellowship in Architecture in memory of Arthur W. Wheelwright of Harvard's class of 1887. The award is made annually to a graduate of the School of Architecture and Design for travel and study abroad, and the stipend is approximately $6,000. To qualify for this honor, recipients must have had considerable practical experience in the profession and must have shown high promise and achievement.

Mr. Haro was born in East Chicago, Ind., and received his elementary and high school education in L'Anse, Mich. In 1955 he was graduated from Harvard's Graduate School of Design with a Master's Degree in Architecture, to climax a varied background in higher education, which began in 1945, on a scholarship, with a study in Civil and Mechanical Engineering at the Michigan College of Mining and Technology. In 1947, he entered the University of Michigan's College of Architecture and Design and was graduated in 1950 with a Bachelor of Arts in Architecture.

While acquiring his formal education, Mr. Haro was associated, for varying periods, with a number of architectural and engineering organizations. He also served, for approximately two years, as an officer with the U.S. Navy during the Korean War. In January 1954, he entered Harvard and while completing his graduate study there, he served as Visiting Critic for the Boston Architectural Center.

In July 1955, Haro joined Albert Kahn Associated Architects and Engineers as an architectural designer, and in 1957, was made an associate of the firm, where he has been responsible for the design of a number of buildings recognized for their excellence in architectural design. Among these, is the new National Bank of Detroit office building which has received considerable as well as favorable nationwide comment.

Haro left for study under the Fellowship grant in October of this year. While abroad he will devote most of his time to studying architecture from the historical point of view with particular emphasis given to monumental and religious structures. As a secondary study, he will investigate contemporary European methods of construction, materials and building technology.

His beginning travels will take him through Southern France, Spain and Italy. In January he will be joined by his wife, Elizabeth, in Zurich, Switzerland, from where he will conduct an intensive study of the historical architecture of Central Europe. Later in the year, Haro will tour Northern France, the Low Countries, Great Britain, and the Scandinavian countries. Upon his return, he will resume his activities as architectural designer for his firm.

John Haro is a registered architect in Michigan and a Corporate Member of The American Institute of Architects assigned to the Michigan Chapter, and the Tau Sigma Delta Honorary Architectural Fraternity. He and Mrs. Haro, a former schoolteacher in Birmingham High School, presently reside in Birmingham, Mich. They have a two-year-old son, John Stephen.

names

ae news

(Continued from page 8)

A major step toward greater understanding between Japanese and American architects through direct exposure of each to the other's architectural design philosophy has been made by *Welton Becket and Associates*, architects and engineers, with announcement by Welton Becket, FAIA, President, that the firm will award an annual working fellowship to a Japanese architect. The architect selected will join Becket's Los Angeles home office architectural design staff for a one-year period. Selection of the fellowship winner will be with the cooperation of the Japan Architects Assn. headed by Kunio Mayekawa, President.

Creative approaches to the solution of management engineering problems will be considered at a meeting of industrial executives to be held at *Illinois Institute of Technology* on February 5 and 6, 1960.

The conference is being sponsored by three Illinois Tech units, the industrial engineering department, Institute of Design and National Center of Education and Research in Equipment Policy and the engineering economics research division of the Armour Research Foundation, IIT affiliate. Workshops and sessions in engineering economics applications, materials handling methods and other topics will be presented. Inquiries should be addressed to Conference Director LeRoy A. Wickstrom, Industrial Engineering Department, Illinois Institute of Technology, 3300 Federal St., Chicago 16, Ill.

Awards

Award winners of the $44,000 *Steel Highway Bridge Design Competition* sponsored by U.S. Steel's American Bridge Division were announced recently. Top winner in the professional classification was Allan M. Beesing, structural design engineer with James J. MacDonald, Buffalo, N.Y., consulting engineer. He was awarded $15,000 for his entry. First award in the student classification went to a joint entry submitted by Niels Gimsing and Hans Nyvold of Copenhagen, Denmark. Both men were students at the Technical University of Denmark. They will share $4,000 for their entry. The competition, conducted under the auspices of the *American Institute of*

ae news

Steel Construction, Inc., required entrants to design a steel bridge to carry a two-lane crossroad over a modern four-lane highway. It was open to professional design engineers and college engineering students anywhere in the world. Winning entries were selected on the basis of originality of design, utilization of the properties of steel, economy, and appearance. The Jury of Award for the competition consisted of four consulting engineers and an architect, all outstanding figures in their respective fields. L. Abbott Post, executive vice-president of the AISC served as chairman.

The most beautiful steel bridges opened to traffic during 1958 were also announced in the annual competition sponsored by the AISC, the national organization representing the structural steel fabricating industry. A distinguished jury selected 13 bridges in 11 states from 104 entries, the largest number of bridges ever submitted in the 31-year old Prize Bridge Competition. The Class I Award for bridges with spans 400 feet or more was awarded to David B. Steinman, internationally known American bridge designer for the Mackinac Bridge, Mackinac Straits, Mich.

Evidence of a new concept of land development for middle-income housing was demonstrated by the winning submissions in the $25,000 architectural competition sponsored by the Mastic Tile Corp. of America and conducted by A. Gordon Lorimer, AIA, of New York City as professional advisor for the competition which was approved by the Committee on Competitions of the AIA. The Grand Prize of $10,000 was won by Messrs. Howard R. Meyer, FAIA, James Reece Pratt, AIA, and John Harold Box, AIA, of Dallas, Tex. Chairman of the Jury of Award was Pietro Belluschi, FAIA, Dean of the School of Architecture at M.I.T.

Award winners in the nationwide *Seventh Annual Industrial and Institutional Landscaping and Beautification* were announced by the American Association of Nurserymen to architects and landscape designers and landscape architects in eighteen states and Washington, D.C., and Canada. Chairman of the Jury of Awards was Charles G. Mortimer, Chairman, General Foods Corp.

MEMORABILIA

Metropolis: is one of a series of booklets on the activities supported by the *Ford Foundation* whose purpose is to present in an informal and non-technical manner the story of various phases of the Foundation's work. "*Metropolis*" is, as the title suggests, an illustrated essay about the problems of urban growth and decline. Slums and housing in cities, their suburbs, and associated administrative programs for urban renewal throughout the U.S., as well as the Ford Foundation's own urban and regional programs, are presented. We believe that architects, engineers and urban planners may wish to peruse this booklet. Copies and further information may be obtained by writing to the Ford Foundation, Office of Reports, 477 Madison Ave., New York 22.

A worthy reassurance: The United States Capitol is built on a solid foundation according to a report by a soil mechanics expert, William H. Mueser of the consulting engineering firm of Moran, Proctor, Mueser and Rutledge of New York City. Investigations of soil conditions and foundations, made necessary by the present construction work of extending the East Portico of the Capitol, demonstrate that the architects and engineers of that day knew their business. Mueser reports that current foundation studies failed to reveal any serious faults in the original foundation construction, and indicated that the architects and civil engineers of 166 years ago were skilled practitioners, even though very little was known of the science of soil mechanics in those days. Of course the men who were responsible for the first architectural and engineering work of the Capitol were remarkable men. We are not surprised. They were commissioned by equally remarkable men—the best minds of the 18th and 19th centuries—the founding fathers. These men left us even a greater foundation than that of the buildings—the Declaration of Independence and the Constitution.

Engineers needed despite computers: The engineering professions reportedly are resorting more and more to electronic computers to handle problems. Such automation has not affected the need for engineers according to Oscar S. Bray, of the Boston engineering firm of Jackson and Moreland, who recently spoke before the convention of the *American Society of Civil Engineers*. He stated that the demand for engineers is growing and he predicted that the "upward pressure" on engineering salaries will continue. Bray acknowledged that much routine calculation and many difficult problems that once absorbed large amounts of engineering effort are now handled readily by the electronic computer. Surveys, however, indicate that the use of computers, due to programming needs, does not reduce the need for engineers as much as it transfers their efforts from one area to another and improves the quality of their output. The demand for engineers, according to Bray, has grown steadily over the past decade. There is every indication that this trend will continue. Two factors were presented as primarily responsible for this outlook: (1) an expanding population which has created a continuously growing demand for the facilities designed by engineers; (2) the increasing complexity of the facilities, which requires the expenditures of many more engineering man-hours than were consumed in the creation of comparable facilities a quarter-century ago.

editorial

Freshman engineering enrollments: a decline of 11 per cent in freshman engineering enrollments in the nation last year is cause for serious concern according to President John T. Rettaliata of the *Illinois Institute of Technology*. Speaking before the annual meeting of IIT's board of trustees, Rettaliata reported that total engineering enrollments in the nation in the fall of 1958 decreased 2.4 per cent over the preceding year. In his report to the board, he described this decline as a "serious setback in the field of education that is of supreme importance in a time of revolutionary technological change." He noted, however, that upward trends in graduate study in engineering were maintained in 1957 and 1958.

Citing a recent poll of deans of engineering, Rettaliata attributed the drop in freshman engineering to three factors: (1) mistaken appraisal of the long-range opportunities in engineering by counselors, students and parents; (2) increased concern about the rigors of engineering education; (3) increased interest in other scientific fields as the result of publicity given developments in atomic and space research.

"The need for engineers is increasing at a greater rate than population gains," he declared, adding that "a strong, long term need for engineers is clearly indicated." Calling for a greater effort on the part of industry, government, education and all organizations to spur the interest of qualified youth, girls as well as boys, in careers in engineering, Rettaliata stated that there still continues to be a lack of public understanding of the proper role or place of engineering in the "Age of Science." More effective communications with the public are necessary so that the engineering profession can receive adequate credit for its accomplishments and achieve its proper stature among the professions. President Rettaliata also reminds us that the nation has two distinct obligations: to "strengthen education to bring about significant, scientific achievements, and to make every effort to prevent global catastrophe through destructive use of these new discoveries." To which we add a solemn amen and an earnest wish for a creative and beautiful new year ahead. *JJC*

books

Design of Industrial Exhaust Systems, *Third Edition, by John L. Alden. New York: The Industrial Press, 1959. 256 pp., 137 illus. $6.00.*

Reviewed by:
*Arthur L. Zigas, PE**

New edition of classic in its field has been extensively revised and brought up to date. An excellent reference work for heating, ventilating and air-conditioning designers involved in miscellaneous industrial exhaust systems. Application of air flow theories to practical exhaust design illustrated in straight-forward terms.

Residential Rehabilitation: Private Profits and Public Purposes *by William W. Nash, directed by Miles L. Colean. New York: McGraw-Hill Book Co., Inc., 1959. 268 pp., illus. $8.00.*

Covers methods, problems, and potential profits of residential rehabilitation as they may affect investment. Primarily intended for private investor, is valuable to planning experts in programming public rehabilitation.

An Introduction to the Dynamics of Framed Structures *by Grover L. Rogers. New York: John Wiley & Sons, Inc., 1959. 358 pp., illus. $10.25.*

Written by a structural engineer using the modal analysis viewpoint, this introductory treatise applies the theory of structural dynamics to buildings and bridges. Examines the analytical aspects of dynamic disturbances as part of the modern concept of engineering science.

Hydraulic Energy Dissipators *by Edward A. Elevatorski. New York: McGraw-Hill Book Co., Inc., 1959. 214 pp., illus. $10.00.*

Provides a survey of various systems in use to dissipate hydraulic energy and of the theory and the technology involved in their design, construction, and operation.

**Mr. Zigas is a consulting engineer in private practice with the firm, Wald and Zigas, New York City.*

index

to advertisers

ADVERTISING REPRESENTATIVES

NEW YORK:
Ed Fregan
Dave Hagenbuch
Dave Kendall
Hagan Publishing Corp.
452 Fifth Ave.
New York 18, N.Y.
LOngacre 3-6143

CHICAGO:
Michael I. O'Connell
Architectural & Engineering News
1791 Howard St.,
Chicago 26, Ill.
ROgers Park 4-0044

ATLANTA:
J. Sidney Crane
22 8th St., N.E.
Atlanta, Ga.
TRinity 2-6720

SAN FRANCISCO:
Jules Thompson
Thompson & Clark Co.,
681 Market St.,
San Francisco 5, Calif.
DOuglas 2-8547

LOS ANGELES:
Bob Clark
Thompson & Clark Co.,
6000 Sunset Blvd., Rm. 202,
Hollywood 28, Calif.
HOllywood 3-4111

calendar

Dec. 20-30 ARCHITECTURAL INST OF JAPAN, KYOTO AND OSAKA: annual convention.

Jan. 25-28 PLANT MAINTENANCE & ENGINEERING SHOW: Convention Hall, Philadelphia, Pa.

25-29 STRESS MEASUREMENT SYMPOSIUM: Arizona State University.

28-30 NORTH CAROLINA CHAPTER, AIA: 46th annual meeting, Sir Walter Hotel, Raleigh, N. C.

Feb. 1-4 AMERICAN SOC OF HEATING AND AIR-CONDITIONING ENGRS: annual meeting, Dallas, Tex.

2-4 SOC OF THE PLASTICS INDUSTRY: 15th reinforced plastics division conference, Edgewater Beach Hotel, Chicago, Ill.

14-18 AMERICAN INST OF MINING, METALLURGICAL, AND PETROLEUM ENGRS: annual meeting, New York City.

14-18 NATIONAL ASSN. OF CORROSION ENGRS: annual meeting, Dallas, Tex.

25 THE ARCHITECTURAL LEAGUE OF NEW YORK: national gold medal exhibition of the building arts held in collaboration with the American Craftsmen's Council through May 15. Museum of Contemporary Crafts, New York City.

Mar. 14-17 AMERICAN CONCRETE INST: convention and exhibit, Hotel Commodore, New York City.

April 5-7 BRI: spring conferences, Statler-Hilton Hotel, New York City.

18-22 AMERICAN INST OF ARCHITECTS: annual convention, San Francisco, Calif.

May 12-14 AMERICAN INST OF ARCHITECTS: south Atlantic regional conference, Winston-Salem, N. C.

23-26 DESIGN ENGINEERING SHOW: Coliseum, New York City.

POSTMASTER: FORM 3547 REQUESTED

Department
845 Ridge Avenue
Pittsburgh 12, Pennsylvania

...g Department
845 Ridge Avenue
Pittsburgh 12, Pennsylvania